



APPENDIXES
USAARL REPORT NO. 81-3

VIBRATION IN A HELMET MOUNTED SIGHT (HMS) USING MECHANICAL LINKAGE

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USAARL

APPENDIXES TO
VIBRATION IN A HELMET
MOUNTED SIGHT (HMS) USING MECHANICAL LINKAGE

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These appendixes, A through D, are the detailed data analysis procedures and the graphic presentations of the vibration spectra. These appendixes support USAARL report number 81-3, title as above.

APPENDIX A

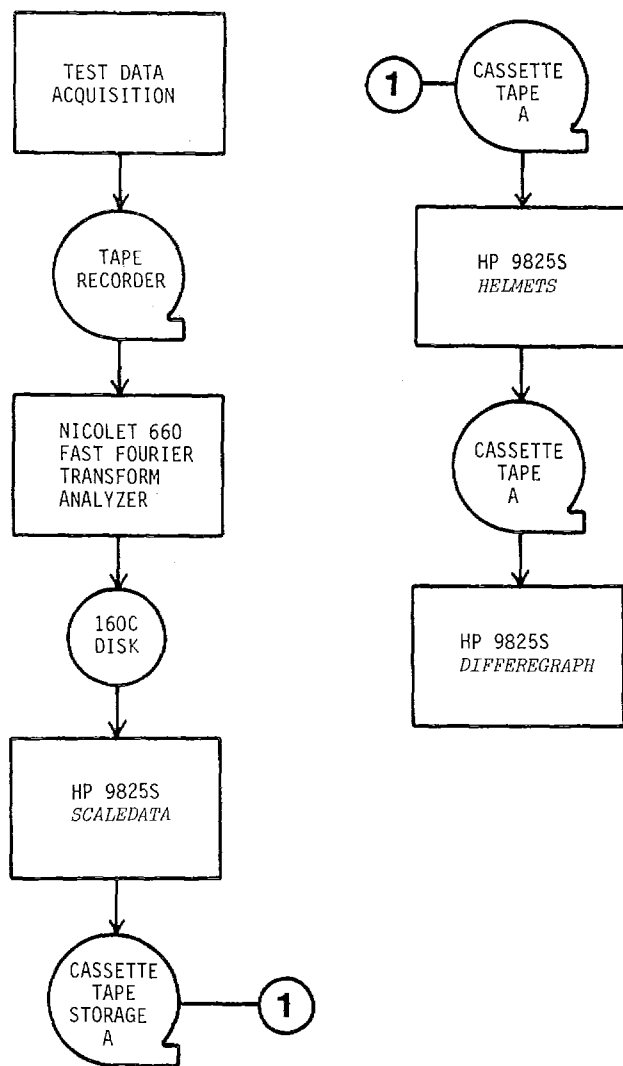
TABLE OF IDENTIFICATION NUMBERS AND FILE NUMBER FOR VIBRATION DATA
PROCESSED ONTO 5 1/2" DISKETTES AND DIGITAL CASSETTE TAPE

TABLE OF IDENTIFICATION NUMBERS AND FILE NUMBER FOR VIBRATON DATA
 PROCESSED ONTO 5 1/2" DISKETTES AND DIGITAL CASSETTE TAPE

ANALOG TAPE NO.	DIGITAL TAPE NO.	HELMET TYPE	AIRCRAFT SPEED	DISK FILE/ID NO.		SPECTRUM ANALYZER CHANNEL	CALIBRATION CONSTANT (m/s ² Per Volt)
SIGHT STATUS							
				CONNECTED	DISCONNECTED		
2	1	Standard SPH-4	Hover	8. 0712791	10. 0712791	X = A	19.6
			40 kn	3. 0612790	4. 0612790	Z = B	
			80 kn	5. 0612790	6. 0612790		
			120 kn	7. 0612790	8. 0612790		
			L.TURN	9. 0612790	10. 0612790		
1	1	Form Fit SPH-4	Hover	2. 1012790	3. 1012790	X = A	39.2
			40 kn	4. 1012790	5. 1012790	Z = B	
			80 kn	8. 1012790	9. 1012790		
			120 kn	10. 1012790	11. 1012790		
			L.TURN	12. 1012790	13. 1012790		
2	2	Standard SPH-4	Hover	1. 1606800	2. 1606800	Y = A	19.6
			40 kn	3. 1606800	4. 1606800	Z = B	
			80 kn	5. 1606800	6. 1606800		
			120 kn	7. 1606800	8. 1606800		
			L.TURN	9. 1606800	10. 1606800		
1	2	Form Fit SPH-4	Hover	2. 1706800	3. 1706800	Y = A	39.2
			40 kn	4. 1706800	5. 1706800	Z = B	
			80 kn	8. 1706800	9. 1706800		
			120 kn	10. 1706800	11. 1706800		
			L.TURN	12. 1706800	13. 1706800		

APPENDIX B
DATA ANALYSIS AND CONTROL SOFTWARE

DATA REDUCTION FLOW CHART



SCALEDATA

This program has two major sections. The purpose of the first section is to transfer data from the 160C data recorder into internal data buffers in the Hewlett-Packard 9825S computer. The second section scales the data and records the data and scaling conditions on cassette tape.

The program as a whole is designed to mimic the Nicolet 660 in its data transfer and scaling functions.

The Hewlett-Packard 9825S computer, the Hewlett-Packard 7225A plotter, and the Nicolet 160C data recorder are all connected via the IEEE 488 bus.

The Nicolet 160C is a two-disk data recorder with a primary disk on the left and a secondary disk on the right. There are two sets of 8 switches on the rear of the 160C. The left set is for the IEEE 488 bus and the right set is for the RS232 bus. Set switches 4, 7, and 8 of the IEEE 488 bus control to 1 and set all others to 0, this allows the 9825S to communicate with the 160C. Turn on the 160C. This resets the machine and records the states of the eight IEEE 488 bus control switches.

Place the 9825S cassette tape which contains the program in the tape recorder unit of the 9825S and load the *SCALEDATA* program into the internal memory of the 9825S. When the program has been loaded, extract the program tape from the tape unit and insert a tape marked with blank files 6710 bytes in length (HP 9825S Operating and Programming Manual, Chapter 9).

Place the disk of data to be analyzed in the primary (left) slot of the 160C. The 9825S displays *Enter 160C file # to be recalled*. Enter the desired disk file number on the calculator keyboard and press the *continue* key to initiate the file recall sequence. When all the buffers stored on that disk file have been transferred to the internal buffers of 9825S, *Recall Completed* is printed and the 9825S performs the *scale-data* routine.

When the scaling is finished the program branches to the *documentation* subroutine. *Information on this file* is displayed. You have 100 spaces in which to put information describing the various conditions under which the data were collected. This information is useful in

identifying the file when it is recalled from the 9825S tape for use in other programs for data manipulation and graphing. When the documentation has been typed in, press the *continue* key and the program branches to the data recording routine.

The 9825S displays *Start at file #, track #?* Each 9825S cassette tape has two tracks, track 0 and track 1. For this program each track will have twenty-one files, file 0 to file 20. File 21 will be a null file. Type in the file number (0 for a new tape) and press the *continue* key, then type in the track number you wish. Press the *continue* key. The 160C file and tag number, the *documentation* information, the two buffers of scaled data, and the two sets of scaling conditions are automatically recorded on the proper file and track of the 9825S cassette tape. The 9825S tape file number is incremented to automatically record the next file. The 9825S displays *Done for the day? Y or N.* Enter *Y* for yes or *N* for no. If you enter *Y* the program ends. If you enter *N* the program returns to *Await* (see Flow Chart) and displays *Enter 160C file # to be recalled.* After the first file is recorded, each cycle through the program will cause the next file to be automatically recorded until file 21 (the null file) is reached. When the internal file number count reaches 21 the tape automatically rewinds, switches tracks, and starts recording at file 0.

HELMETS

The purpose of this program is to plot scaled spectral data stored on cassette tapes. Unscaled data should be passed through the *SCALEDATA* program prior to plotting with *HELMETS*. *HELMETS* computes an RMS value and displays it next to each spectrum.

The *HELMETS* program requires:

1. A Hewlett-Packard 9825S computer.
2. A Hewlett-Packard 7225A plotter.
3. A cassette tape on which the *HELMETS* program is stored.
4. A cassette tape on which scaled data to be analyzed is stored.
5. Paper for the plotter.

Connect the 9825S and 7225A via the IEEE 488 bus and switch both machines on. Set up the plotter with paper and pen and insert the program tape into the 9825S. Load the file containing the *HELMETS* program into the active memory of the 9825S. When the program has been loaded, extract the program tape and insert a cassette tape containing scaled data files

to be analyzed. It is convenient to have a list of what data is on each file to make recalling the files easier. This file index should contain the 160C file and tag number, documentation of conditions, and the cassette tape file number. You will also use this file index in the *DIFFER-GRAPH* program. When you are ready to start the program, press the *run* key.

The 9825S displays *WHICH AXIS TO PLOT? X, Y, Z.* Enter the desired axis with a capital letter and press the *continue* key. The 9825S displays *HELMET TYPE? FORM-FIT, SPH4.* Enter either *FORM-FIT* or *SPH4* in capitals and press the *continue* key. *FLIGHT CONDITION?* is displayed on the 9825S. There are five (5) flight conditions: hover, 40 kn, 80 kn, 120 kn, left turn. Enter the appropriate flight condition in capitals and press the *continue* key.

When the *continue* key is pressed the plotter will label the axis helmet type, and flight condition at the top of the paper. At the bottom the plotter will label *FIGURE . HELMET ACCELERATION.* The 9825S is now ready to process data so it displays *RECALL FILE #, TRACK #?* Enter the 9825S tape file number you want and press the *continue* key. Enter the track number and press the *continue* key. The tape file is loaded and the prerecorded 160C file and tag number, and the documentation string is printed. The 9825S displays *DO YOU WANT THIS FILE? Y OR N.* Check the printed documentation to see if you recalled the correct file. Enter *Y* for Yes or *N* for No and press the *continue* key. If you enter *N*, the 9825S will display, *RECALL FILE #, TRACK #?*, and you can recall another file. If you enter *Y*, the 9825S displays, *IS THIS FILE CONNECTED? Y or N.* There are two helmet sight conditions, connected and disconnected. This condition should be included in the documentation string of the *SCALEDATA* program printed on the 9825S printer in a previous step. Enter *Y* or *N* depending on the condition and press *continue*. If the file is data from the connected condition, the plotter will draw the graph axes on the top half of the paper. The plotter will label the axes and write *SIGHT CONNECTED* and $RMS = \quad M/s^2$ to the right of the graph area. The plotter will plot the scaled data for the indicated condition and the computer will calculate the RMS value for the entire spectrum. When the graph is completed the plotter will label the RMS value as a five decimal place number. The prerecorded 160C scaling conditions string is checked and either, *NORMALIZED TO BETA* or *NORMALIZED PER HZ* is labeled below the RMS value. *RECALL SECOND FILE #, TRACK #?* is displayed and the machine is ready to recall another file.

On each figure, a *connected* and *disconnected* file for the same conditions is required. If you had recalled a disconnected file first, the plotter would have done its graphing and labeling on the lower half of the paper. When both graphs have been drawn, *DONE FOR THE DAY? Y OR N* is displayed. If you enter *Y*, the program ends and you would have to press the *run* key to start again. If you enter *N*, the 9825S displays, *CHANGE PAPER*, to remind you to change the plotter paper, waits five (5) seconds and automatically runs the program again.

DIFFERGRAPH

The purpose of this program is to plot a graph of the difference between two spectra (*connected* and *disconnected*). The RMS value for each spectrum is calculated by *HELMETS* and may be entered via the keyboard. The difference between the two RMS values is computed and displayed next to the graph.

The *DIFFERGRAPH* requires:

1. A Hewlett-Packard 9825S Computer.
2. A Hewlett-Packard 7225A plotter.
3. Plotter paper.
4. A 9825S cassette tape containing the program.
5. A 9825 cassette tape containing scaled data to be analyzed.

Connect the 9825S computer and the 7225A plotter via the IEEE 488 bus and switch on the machines. Ready the plotter with pen and paper and insert the program tape. Load the program into the internal memory of the computer, extract the program tape, and insert the data tape to be analyzed. Press *run* to start the program.

The 9825S displays *WHICH AXIS TO PLOT?* X, Y, Z. Enter the appropriate axis using a capital letter and press *continue*. *HELMET TYPE?* *FORM-FIT*, *SPH4* is displayed. Enter the helmet type in capital letters and press *continue*. *FLIGHT CONDITION?* is displayed. Enter the correct flight condition from the list provided in *HELMETS*, and press *continue*.

The plotter will draw and label the axes. *FIGURE . DIFFERENCE IN HELMET ACCELERATION* will be labeled at the bottom of the page. To the right of the graph area and from top to bottom the following labels will be drawn: The axis, the helmet type, the flight condition, *SIGHT CONNECTED -*, *SIGHT DISCONNECTED*, *DIFFERENCE IN*, *RMS =* M/s^2 . *NORMALIZED TO BETA?* Y or N is displayed. Look at the figures drawn as the result of the *HELMETS* program and enter Y or N as appropriate. If you enter Y, *NORMALIZED TO BETA* is labeled. The 9825S is now ready for the data to be analyzed.

RECALL FIRST FILE #, TRACK#? is displayed. The file index mentioned in *HELMETS* would be useful here to make recalling the correct file easier. Enter the file number, press *continue*, enter the track number, and press *continue*. The file is recalled and the 160C file and tag number and the documentation string are printed on the 9825S. *DO YOU WANT THIS FILE?* Y or N is displayed. Enter Y or N after checking the documentation string printout. If you enter N, *RECALL FIRST FILE #, TRACK #?* is displayed and you can recall another file. *IS THIS FILE CONNECTED?* Y or

N is displayed. If you enter *Y* all of the file buffers are transferred to the first set of data buffers and *RECALL SECOND FILE #, TRACK #?* is displayed. If you enter *N*, all of the file buffers are transferred to the second set of data buffers and *RECALL SECOND FILE #, TRACK #?* is displayed. The program loops back and recalls files until two files, one connected and one disconnected, have been recalled and accepted.

The 160C file and tag number of the connected file and disconnected file are drawn between the flight condition label and *SIGHT CONNECTED-*. The 9825S computes the difference values and the plotter draws the graph. When the graph is finished, *ENTER RMS OF CONNECTED FILE* is displayed. Enter the proper RMS value taken from the figures produced by the *HELMETS* program and press *continue*. *ENTER RMS OF DISCONNECTED FILE* is displayed. Enter the proper RMS value and press *continue*. The disconnected RMS is subtracted from the connected RMS and the result is drawn in the spaces in the *RMS =* *M/s²* label.

DONE FOR THE DAY? Y or N is displayed. If you enter *N*, *CHANGE PAPER* is displayed. The 9825S waits 5 seconds and the program runs again automatically. If you enter *Y* the program ends.

```

0: dev "160c",
  708;dev "488",7
1: prt " Nicole
  t 160c","Suppor
  t Programs",
  "USAARL"
2: dsp "Initiali
  zing..."ifxd 3
3: dim I$(130),
  K$(1560),N$(156
  0),E$(30)
4: dim S$(15),
  Z$(3),A$(1560),
  I(130),E(30),
  Y(4),C(10),U$(1
  )
5: dim F$(1),
  R$(12),Q$(100),
  D(400),H(400),
  A(11),B(11)
6: oni "488",
  "SRQ";eir "488"
7: buf "660Buf0"
  ,I$,3;buf "660B
  uf4",K$,3
8: buf "660Buf7"
  ,N$,3;buf "660B
  ufE",E$,3;buf
  "dump",A$,3
9: time 500;on
  err "error"
10: "Await":ent
  "Enter 160c
  file# to be
  recalled",Z$
11: fmt 1,"Recal
  l file ",c3;
  wrt 16.1,Z$
12: "R
  +20"+S$;Z$+S$[
  10,12];dsp S$;
  esb "clrbufs"

```

```

13: cfa 2;0→T;
  wtb "160c",S$
14: "rolloop":ei
  r "488";esb
  "transfer"
15: if fls1;cfa
  1;eto "wrap"
16: eir "488",0
17: if char(X)="
  0";eto "input0"
18: if char(X)="
  1";eto "input1"
19: if char(X)="
  4";eto "input4"
20: if char(X)="
  5";eto "input5"
21: if char(X)="
  6";eto "input6"
22: if char(X)="
  7";eto "input7"
23: if char(X)="
  8";eto "input8"
24: if char(X)="
  9";eto "input9"
25: if char(X)="
  A";eto "inputA"
26: if char(X)="
  B";eto "inputB"
27: if char(X)="
  E";eto "inputE"
28: eir 7;prt
  "UNKNOWN BUFFER
  "
29: fmt 1,c11,
  c1;wrt 16.1,
  "660 Buffer ",
  char(X);eto
  "Await"
30: "input0":tfr
  "160c","660Buf
  0",111

```

```

31: if (rds("660
    Buf0")÷L)=-1;
    jmp 0
32: sto "rcllloop
"
33: "input1":tfr
    "160c","dump",
    1024
34: if (rds("dum
    p")÷L)=-1;jmp 0
35: sto "rcllloop
"
36: "input4":tfr
    "160c","660Buf
    4",1539
37: if (rds("660
    Buf4")÷L)=-1;
    jmp 0
38: sto "rcllloop
"
39: "input5":tfr
    "160c","dump",
    1539
40: if (rds("dum
    p")÷L)=-1;jmp 0
41: sto "rcllloop
"
42: "input6":tfr
    "160c","dump",
    1539
43: if (rds("dum
    p")÷L)=-1;jmp 0
44: sto "rcllloop
"
45: "input7":tfr
    "160c","660Buf
    7",1539
46: if (rds("660
    Buf7")÷L)=-1;
    jmp 0
47: sto "rcllloop
"

```

```

48: "input8":tfr
    "160c","dump",
    1539
49: if (rds("dum
    p")÷L)=-1;jmp 0
50: sto "rcllloop
"
51: "input9":tfr
    "160c","dump",
    1539
52: if (rds("dum
    p")÷L)=-1;jmp 0
53: sto "rcllloop
"
54: "inputA":tfr
    "160c","dump",
    132
55: if (rds("dum
    p")÷L)=-1;jmp 0
56: sto "rcllloop
"
57: "inputB":tfr
    "160c","dump",
    220
58: if (rds("dum
    p")÷L)=-1;jmp 0
59: sto "rcllloop
"
60: "inputE":tfr
    "160c","660Buf
    E",11
61: if (rds("660
    BufE")÷L)=-1;
    jmp 0
62: sto "rcllloop
"
63: "wrap":if
    fl÷3;cf÷3;sto
    "Await"
64: ent "DO YOU
    WANT THIS FILE?
    Y or N",F$

```

```

65: if not bit(0
    ,num(F$));sto
    "Await"
66: prt "Recall
    completed";sto
    "scale data"
67: "transfer":i
    f fls0=0;jmp 0
68: buf "dump"
69: cfs 0;if
    fls2;cfs 2;sto
    "Await"
70: if bit("0100
    1010",T);asb
    "shiftin"
71: if bit("0100
    0010",T);ret
72: if bit("1100
    0110",T);sfs 1;
    ret
73: if X=28 and
    fls3 and S$#
        ";
    sfs 1;ret
74: sto "transfe
    r"
75: "shiftin":
    "+S$
76: "silloop":rdb
    ("160c")+X;if
    bit(0,rds("488"
    ));sfs 4
77: if X=28;if
    S$[2,8]#
        ";prt S$;S$[4,
    15]+R$
78: if X=28 or
    X=30;jmp 2
79: S$[2,15]+S$[
    1,14];char(X)+S
    $[15];dsp S$

```

```

80: if fls0 or
    fls4;cfs 4;ret
81: sto "silloop"
82: "SRQ":rds("1
    60c")+T;sfs 0
83: if bit("111"
    ,T);sfs 3;prt
    "* NAK from
    160c*";30+X
84: if bit("1111
    1011",T)=0;eir
    "488";iret
85: rem "160c";
    prt "*** 160c
    has ***","**
    been reset **"
86: sfs 2;spc 1;
    eir "488";iret
87: "clrbufs":bu
    f "660Buf0";
    buf "660Buf4"
88: buf "660Buf7
    ";buf "660BufE"
    ;buf "dump"
89: ret
90: "error":if
    rom#69 or ern#4
    ;sto "error2"
91: prt "** TIME
    D OUT **","CHE
    CK ADDRESSES."
92: "error2":fmt
    1,"Error ",cl,
    f2.0,"line",
    f3.0
93: if rom=0;
    wrt 16.1," ",
    ern;erliend
94: if rom#0;
    wrt 16.1,char(r
    om),ern;erliend
95: "scale data"
    ;jmp 1

```

```

96: "numbers
   $":for G=1 to
   111
97: num(I$[G])÷I
   [G]
98: next G
99: for G=1 to
   14
100: num(E$[G])÷
   E[G]
101: next G
102: 4÷0
103: for G=1 to
   400
104: num(K$[0])÷
   Y[1]
105: num(K$[0+
   1])÷Y[2]
106: num(K$[0+
   2])÷Y[3]
107: esb "3 byte
   float"
108: Y[4]÷D[G]
109: 0+3÷0
110: next G
111: 4÷0
112: for G=1 to
   400
113: num(N$[0])÷
   Y[1]
114: num(N$[0+
   1])÷Y[2]
115: num(N$[0+
   2])÷Y[3]
116: esb "3 byte
   float"
117: Y[4]÷H[G]
118: 0+3÷0
119: next G
120: esb "Arms"
121: esb "Crms"
122: for G=1 to
   10:C[G]÷A[G];
   next G;bit(3,
   I[21])÷A[11]
123: for J=1 to
   400
124: rD[J]*C[10]
   *(2πC[9]*J)↑C[2
   ]÷D[J]
125: next J
126: esb "Brms"
127: esb "Crms"
128: for G=1 to
   10:C[G]÷B[G];
   next G;bit(3,
   I[21])÷B[11]
129: for J=1 to
   400
130: rH[J]*C[10]
   *(2πC[9]*J)↑C[2
   ]÷H[J]
131: next J
132: esb "docume
   ntation"
133: if fl÷6;
   jmp 2
134: beepient
   "START AT FILE
   #?",Q;fl÷7÷P;
   trk P
135: rcf Q,R$,
   Q$,D[*],H[*],
   A[*],B[*]
136: prt "STORED
   ON FILE #",Q;
   prt "TRACK",P;
   spc 2
137: prt "*****
   *****";Q+
   1÷Q;sfa 6
138: if Q=21;
   rew;cmf 6,7
139: beepient
   "DONE FOR THE
   DAY? Y or N",F$
140: if bit(0,
   num(F$));dsp
   "SI-0-NARA";end

```

```

141: sto "Await"
142: "3 byte
    float":
143: if bit(7,
    Y[1]);-band(cmp
    Y[1]+1,255)→Y[1
    ]
144: 0→Y[4]
145: shf(Y[2],-
    8)+Y[3]→Y[2]
146: if bit(15,
    Y[2]);-(cmpY[2]
    +1)→Y[2]
147: 2↑(Y[1]-
    15)*Y[2]→Y[4]
148: ret
149: "cell width
    ":
150: jmp I[10]mo
    d3+1
151: 1→C[9];jmp
    3
152: 2→C[9];jmp
    2
153: 5→C[9]
154: C[9]10↑int(
    I[10]/3)/400→C[
    9]
155: ret
156: "2 byte
    integer":
157: E[8]→Y[2];
    E[9]→Y[3]
158: shf(Y[2],-
    8)+Y[3]→Y[2]
159: if bit(15,
    Y[2]);-(cmpY[2]
    +1)→Y[2]
160: ret
161: "Arms":
162: jmp I[5]mod
    3+1
163: 1→C[1];jmp
    3
164: 2→C[1];jmp
    2
165: 5→C[1]
166: C[1]10↑int(
    I[5]/3-1)→C[1];
    prt "ATTa",C[1]
167: I[26]→C[2];
    prt "int/diff",
    C[2]
168: ent "want
    to set EU/V? Y
    or N",U$
169: if bit(0,
    num(U$));ent
    "EU/V?",V;V→Y[4
    ];jmp 5
170: I[58]→Y[1]
171: I[59]→Y[2]
172: I[60]→Y[3]
173: esb "3 byte
    float"
174: Y[4]→C[3];
    prt "EU/Va",
    C[3]
175: ret
176: "Brms":
177: jmp I[8]mod
    3+1
178: 1→C[1];jmp
    3
179: 2→C[1];jmp
    2
180: 5→C[1]
181: C[1]10↑int(
    I[8]/3-1)→C[1];
    prt "ATTb",C[1]
182: I[27]→C[2];
    prt "int/diff",
    C[2]

```

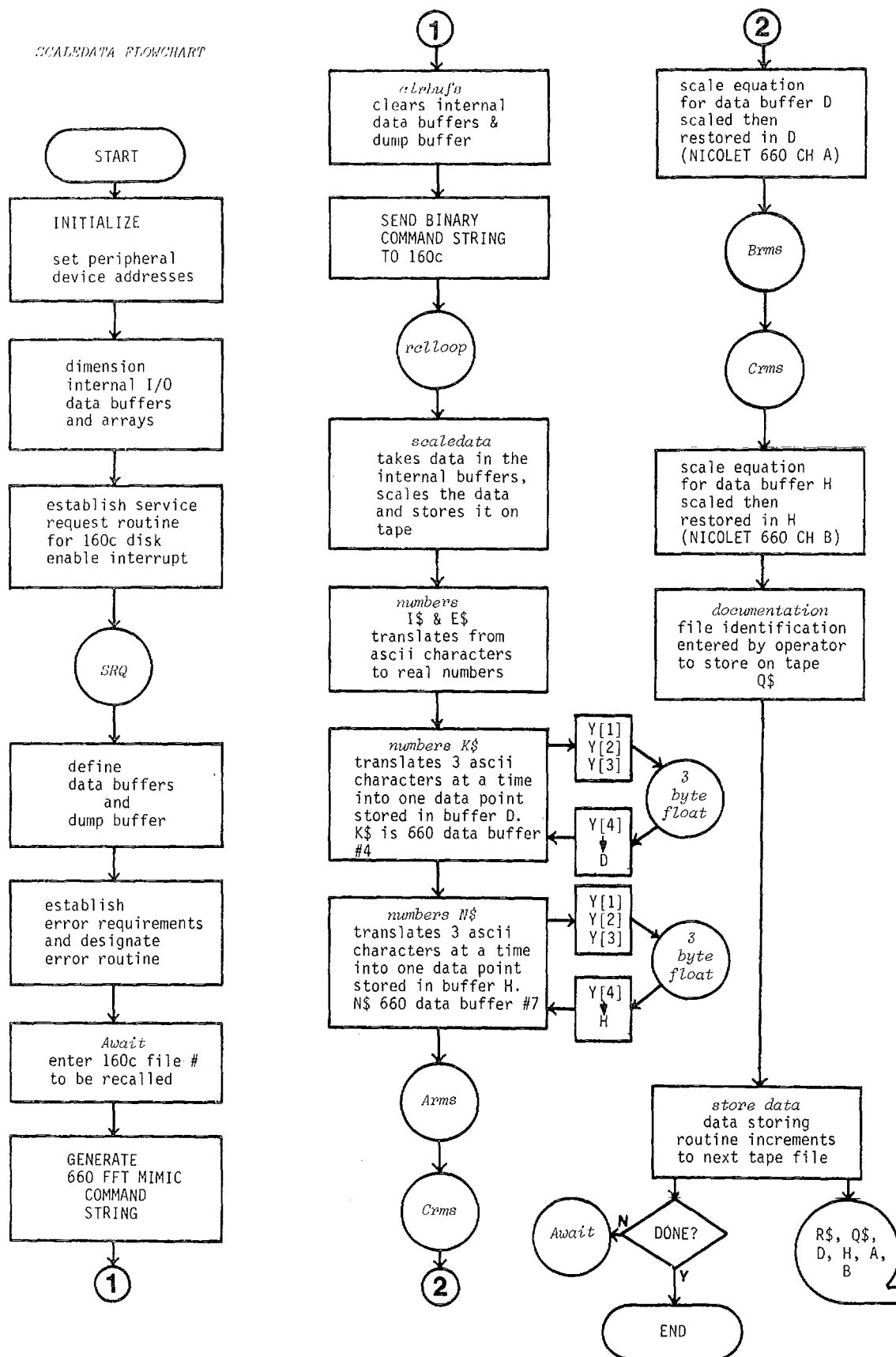


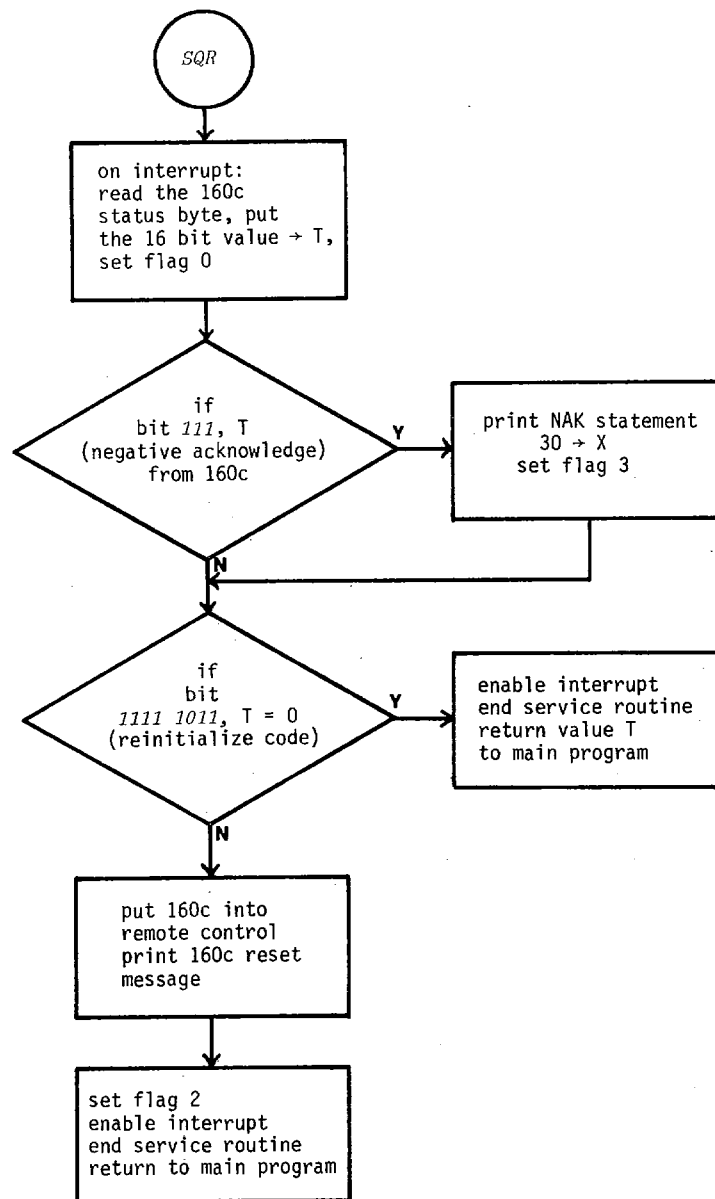
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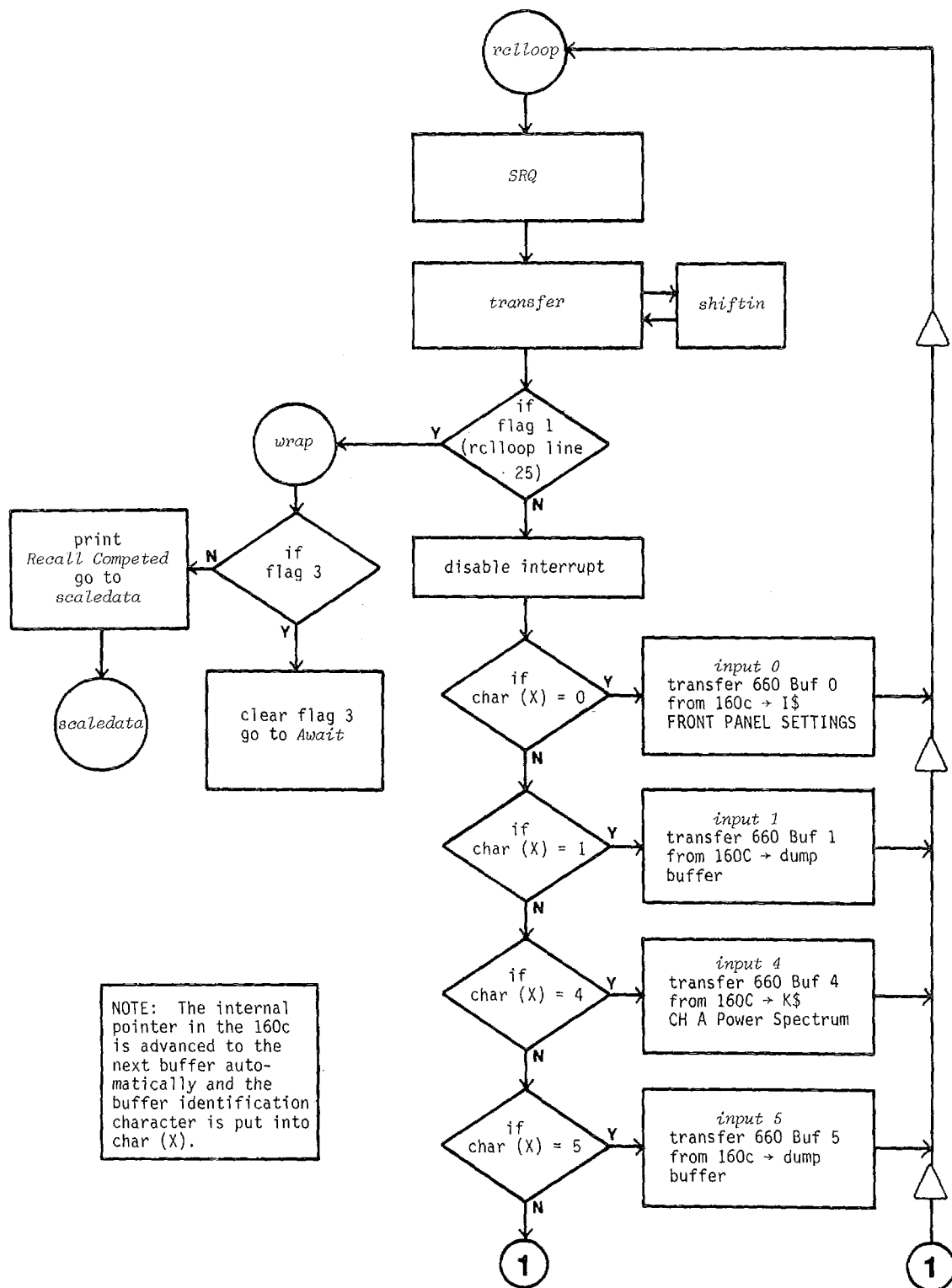
183:  ent "want
      to set EU/V? Y
      or N",U$
184:  if bit(0,
      num(U$));ent
      "EU/V?",V;V→Y[4]
      ;jmp 5
185:  I[61]→Y[1]
186:  I[62]→Y[2]
187:  I[63]→Y[3]
188:  esb "3 byte
      float"
189:  Y[4]→C[3];
      prt "EU/Vb",
      C[3]
190:  ret
191:  "Crms":
192:  ent "set
      relative factor
      ? Y or N",U$
193:  if bit(0,
      num(U$));ent
      "factor?",V;
      V→Y[4];jmp 5
194:  I[64]→Y[1]
195:  I[65]→Y[2]
196:  I[66]→Y[3]
197:  esb "3 byte
      float"
198:  Y[4]→C[5];
      prt "REL",C[5]
199:  if I[22]=0;
      1.333→C[6];if
      I[22]=1;2→C[6]
200:  if I[22]>1;
      prt "invalid
      data type";eto
      "Await"
201:  prt "WF",
      C[6]
202:  esb "2 byte
      integer"
203:  Y[2]→C[7];
      prt "avg N",
      C[7]
204:  esb "cell
      width"
205:  if not bit(
      3,I[21]);1→C[8]
      ;jmp 4
206:  if bit(3,
      I[21]);prt "Per
      Hz is set"
207:  if I[22]=0;
      1.944→C[9]→C[8]
208:  if I[22]=1;
      C[9]→C[8]
209:  if I[22]>1;
      prt "invalid
      CONT/TRANS mode
      ";eto "Await"
210:  prt "BETA",
      C[8]
211:  (C[11]/r2)C[
      3]C[5]C[6](C[7]
      *C[8])↑(-.5)→C[
      10]
212:  prt "C9",
      C[9];prt "C10",
      C[10];spc 1
213:  ret
214:  "documentat
      ion":
215:  ent "inform
      ation on this
      file",Q$
216:  ret
*32486

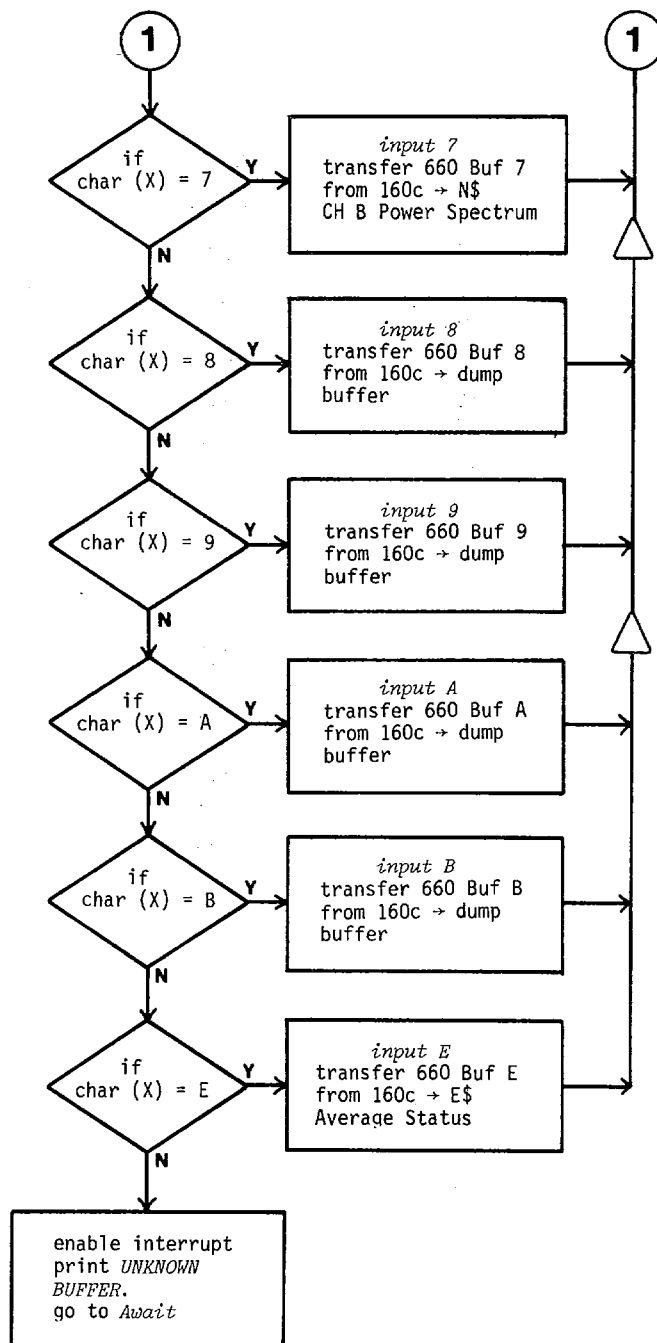
```

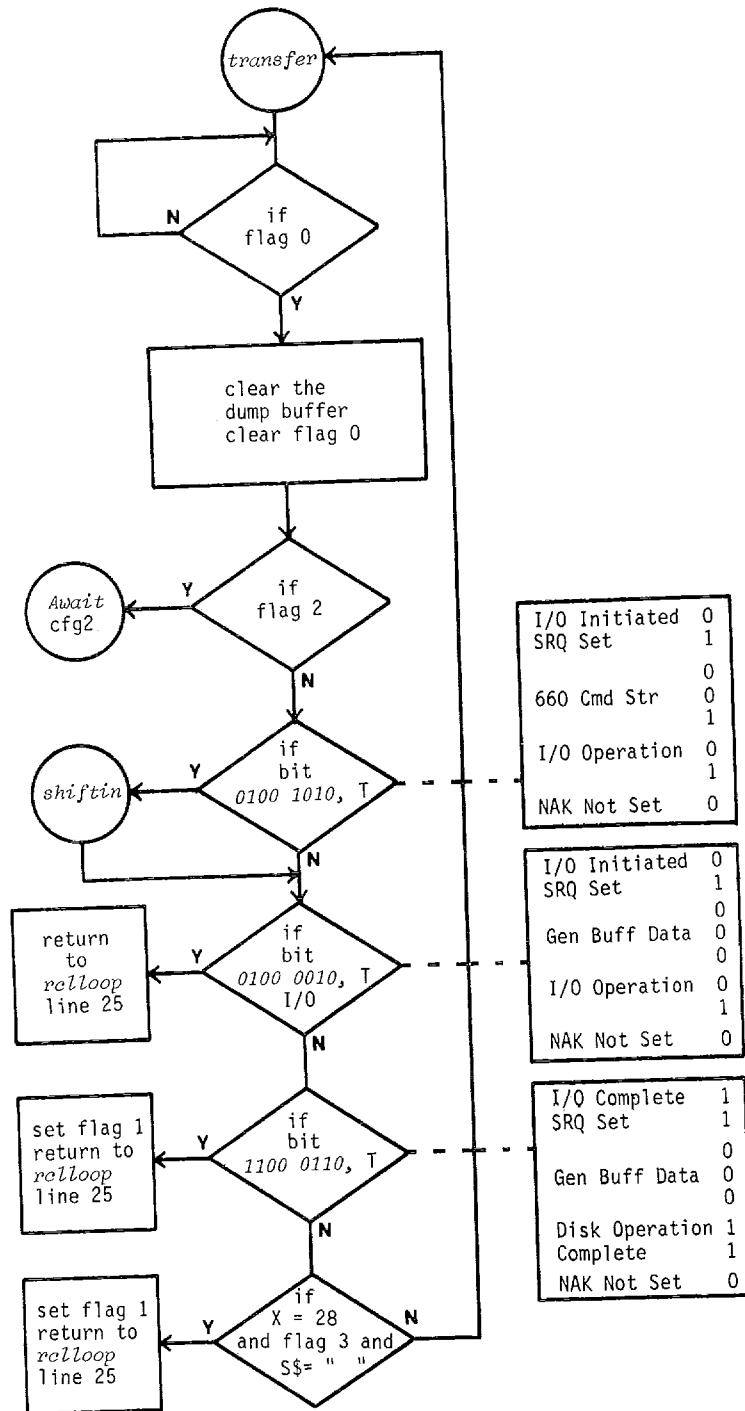
SCALEDATA FLOWCHART

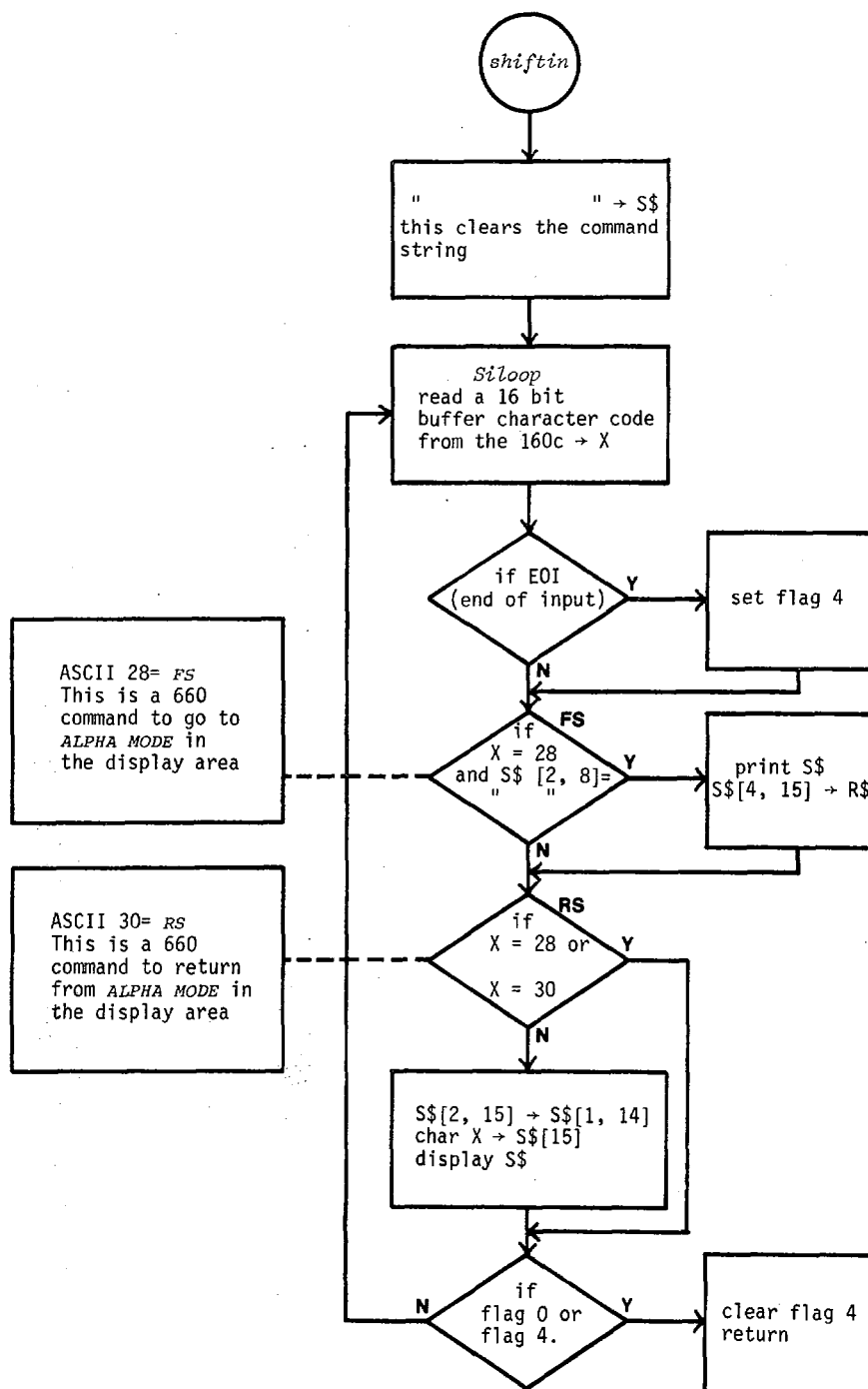


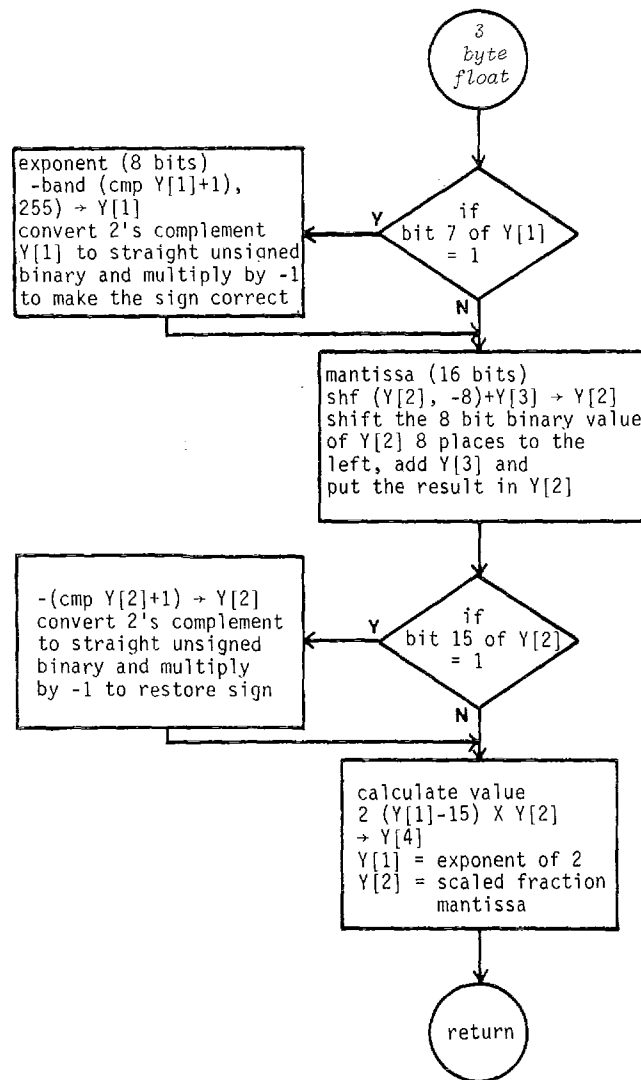


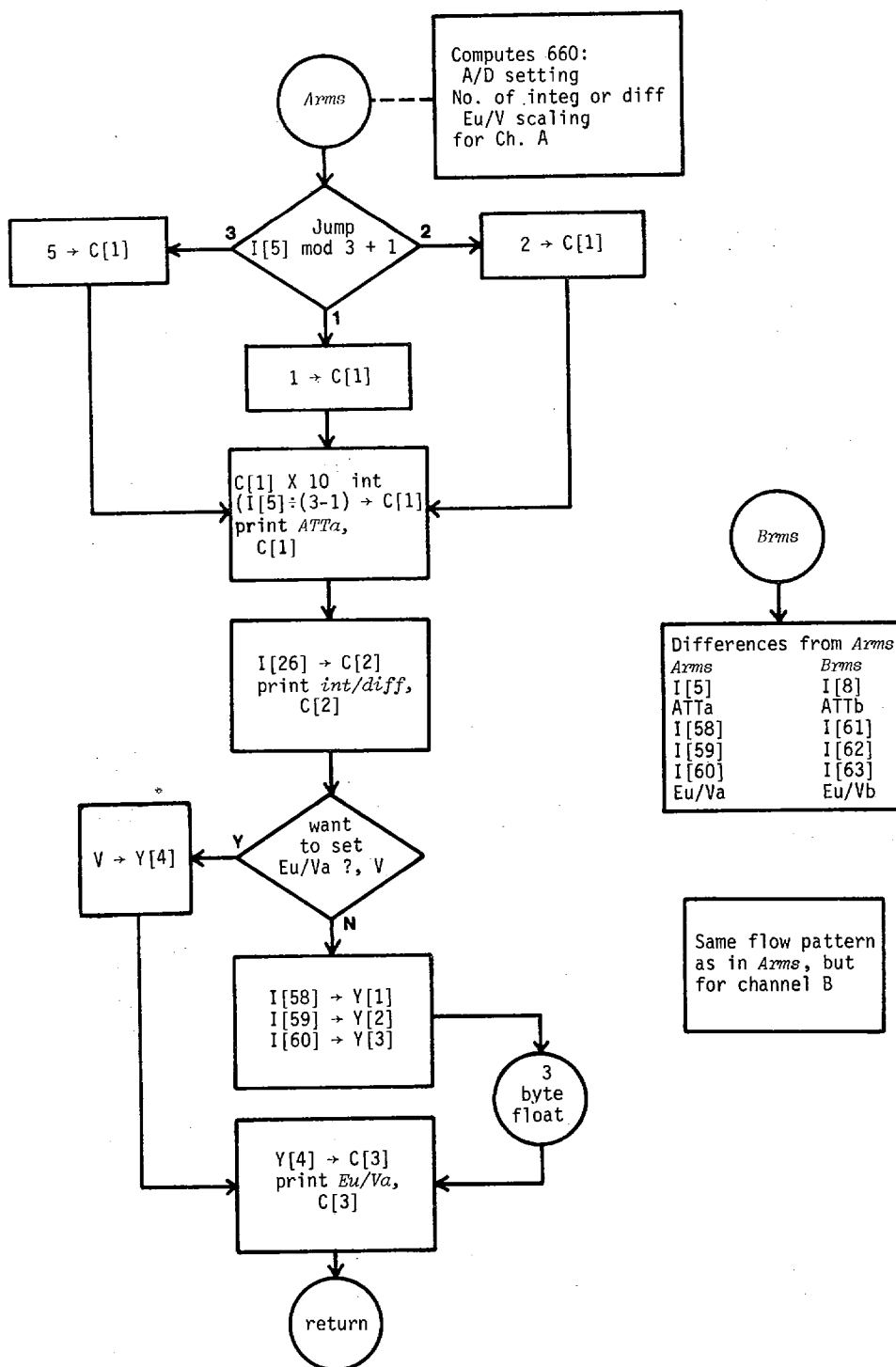


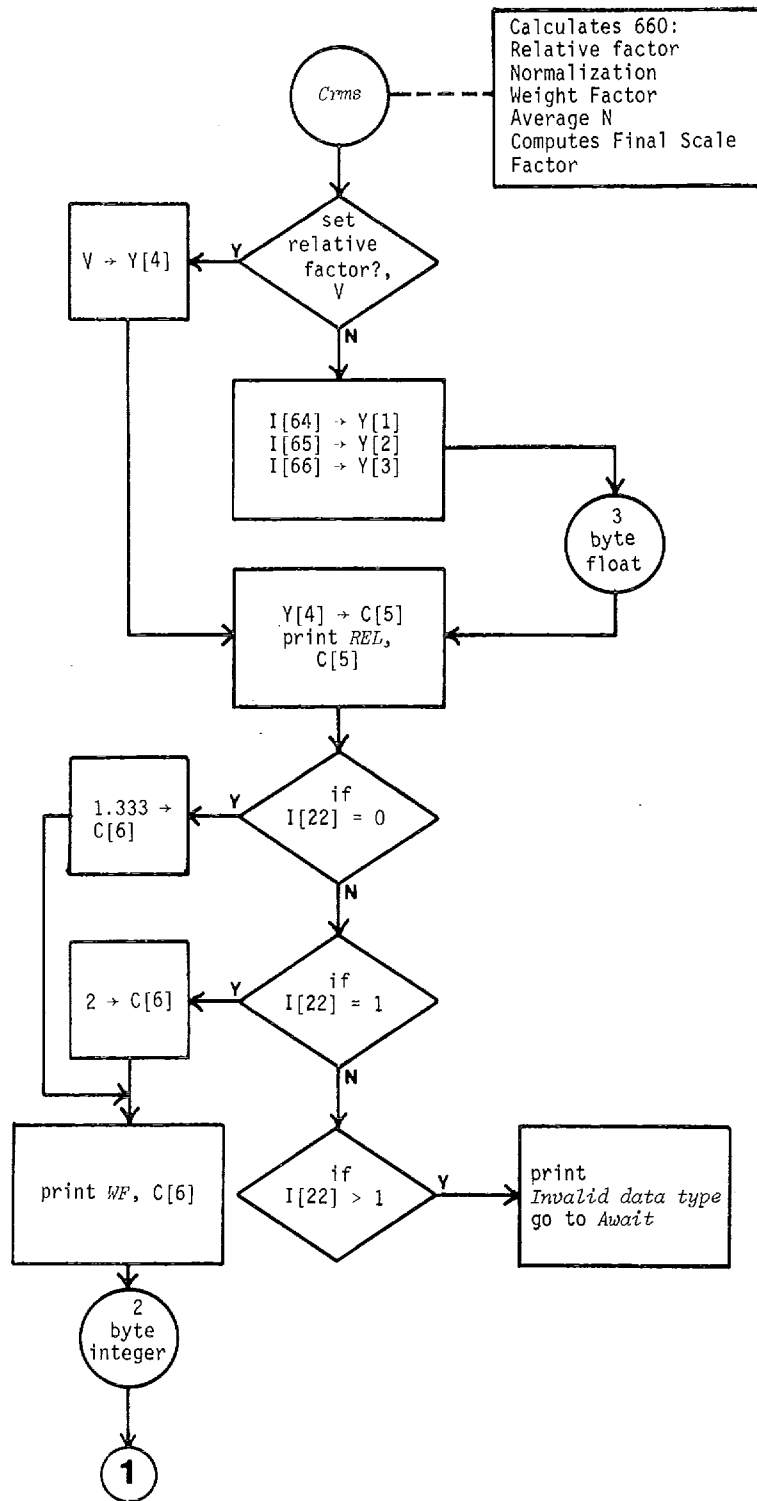


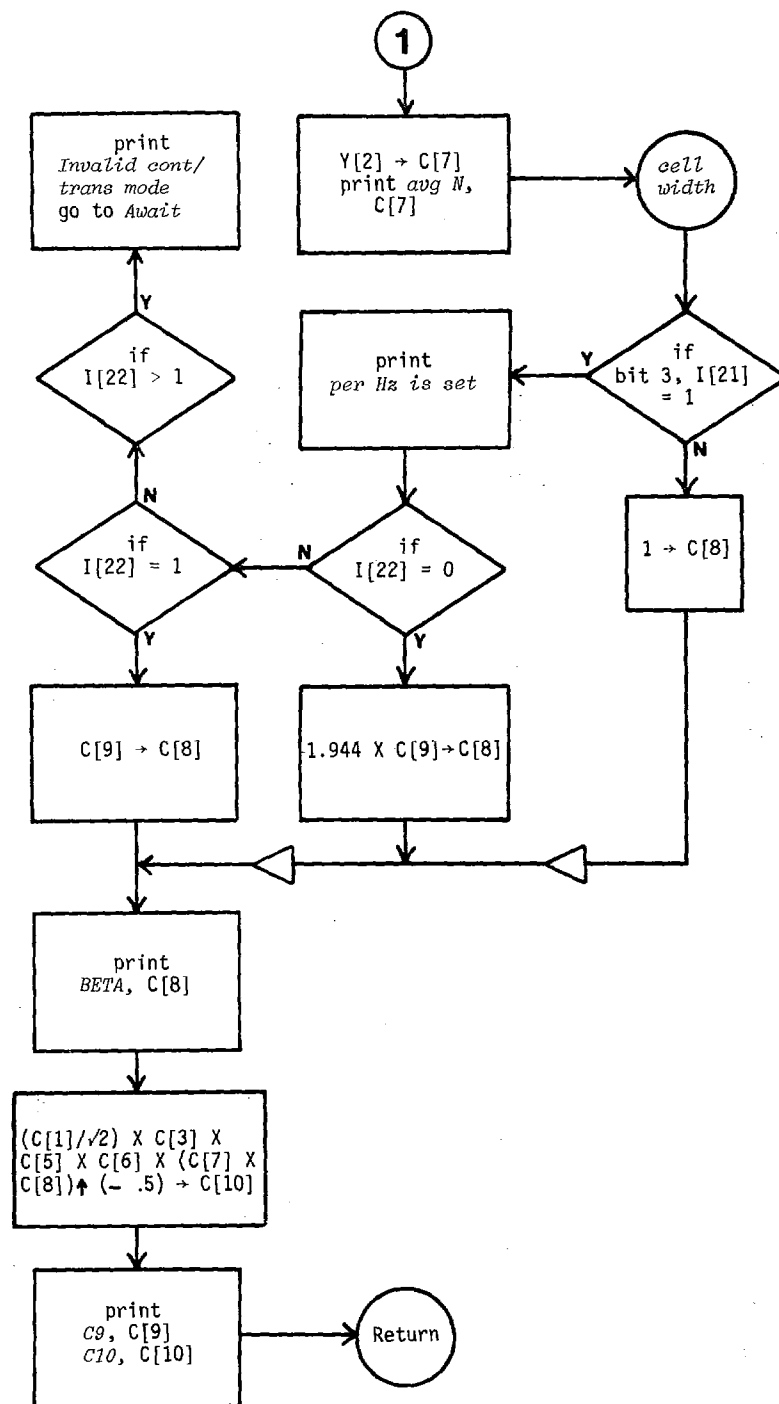


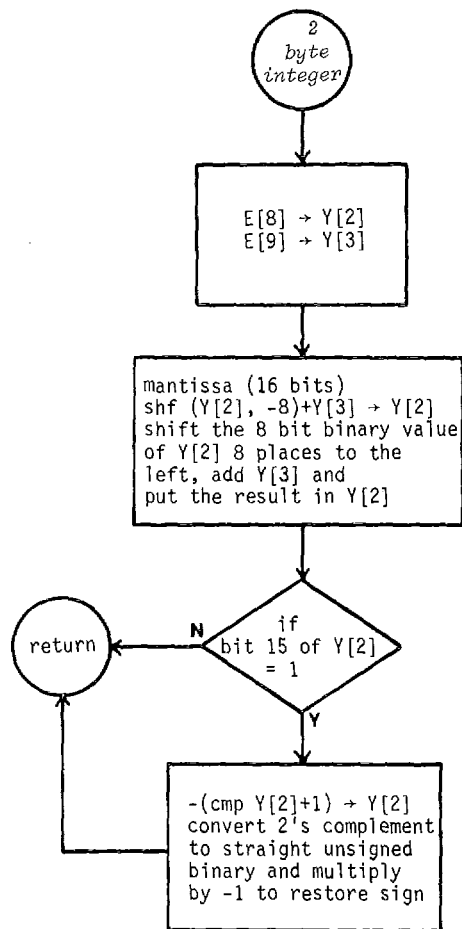


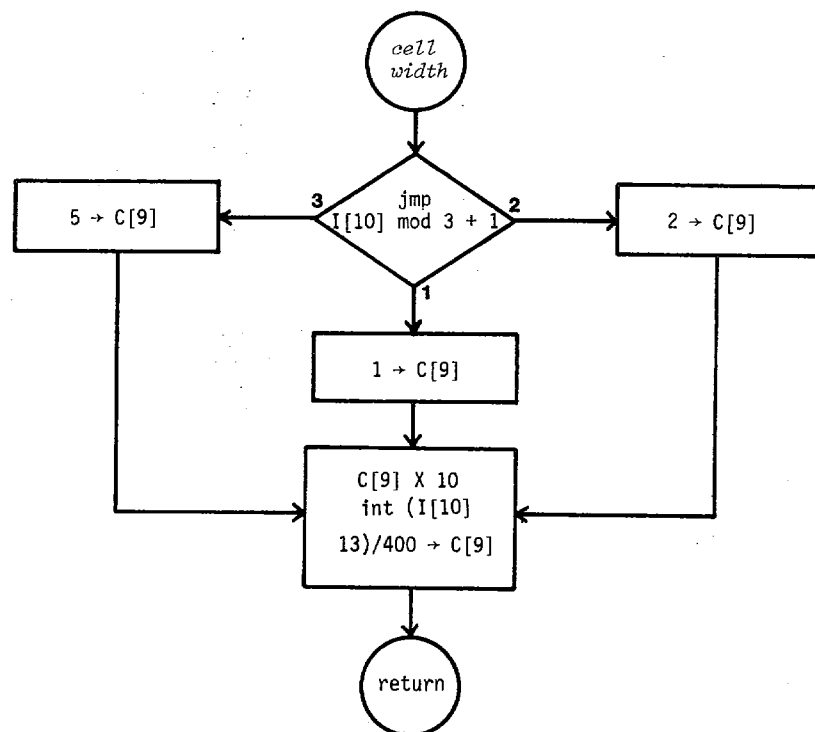












```

0: dim R$[12],
  Q$[100],D[400],
  H[400],A[11],
  B[11]

```

```

1: dim J$[1],
  K$[10],L$[10],
  F$[1]

```

```

2: ent "WHICH
  AXIS TO PLOT?
  X,Y,Z",J$

```

```

3: ent "HELMET
  TYPE? FORM FIT,
  SPH4",K$

```

```

4: ent "FLIGHT
  CONDITION?",L$

```

```

5: pclr:sc1 0,
  2000,0,6;ofs
  300,1

```

```

6: csiz 1.75,2,
  1;plt 350,4.5,
  1;lbl J$,"-AXIS
  ",K$,"",L$

```

```

7: csiz 1.5,2,1;
  plt 350,-.6;
  lbl "FIGURE
  . HELMET ACCEL
  ERATION"

```

```

8: ent "RECALL
  FIRST FILE#,
  TRACK#?",F,T

```

```

9: trk T;ldf F,
  R$,Q$,D[*],H[*]
  ,A[*],B[*]

```

```

10: prt R$;spc
  1;prt Q$;spc 2

```

```

11: ent "DO YOU
  WANT THIS FILE?
  Y or N",F$

```

```

12: if bit(0,
  num(F$));jmp 2

```

```

13: goto 8

```

```

14: ent "IS THIS
  FILE CONNECTED
  ? Y or N",F$

```

```

15: if bit(0,
  num(F$));sfa 1;
  ofs 0,2.4

```

```

16: if not bit(0,
  num(F$));sfa 2

```

```

17: wrt 705,"t1
  0,.5";fxd 0;
  csiz 1.5,2,1

```

```

18: xax 0,50,0,
  1000,20

```

```

19: yax 0,.5,0,
  2,2

```

```

20: plt 150,-
  .25,1;lbl "FREQ
  UENCY (TIC INTE
  RVAL IS 50HZ)"

```

```

21: csiz 1.5,2,
  1,90;plt -75,
  .35,1;lbl "INTE
  NSITY M/S2"

```

```

22: plt 1050,
  1.75,1;csiz
  1.75,2,1

```

```

23: if not fl#2;
  lbl "SIGHT CONN
  ECTED"

```

```

24: if fl#2;lbl
  "SIGHT DISCONNE
  CTED"

```

```

25: plt 1050,
  1.25,1;lbl R$;
  plt 1050,.75,1;
  lbl "RMS="

```

```

26: plt 1375/
  .75,1;lbl "M/
  S2";plt 0,0,1;
  0>V;fxd 5

```

```

27: if not bit("
  10",num(J$));
  sfa 3

```

```

28: if fls3;for
   G=5 to 1000 by
   5;plt G,D[G/5],
   2;next G

```

```

29: if fls3;for
   G=1 to 200;D[G]
   ↑2+V→V;next G

```

```

30: if fls3;if
   not bit(3,A[11])
   ;V/1.944→V

```

```

31: if fls3;if
   not bit(3,A[11])
   ;plt 1050,.25,
   1;lbl "NORMALIZ
   ED TO BETA"

```

```

32: if fls3;if
   bit(3,A[11]);
   plt 1050,.25,1;
   lbl "NORMALIZED
   PER HZ"

```

```

33: if bit("10",
   num(J$));sfa 4

```

```

34: if fls4;for
   G=5 to 1000 by
   5;plt G,H[G/5],
   2;next G

```

```

35: if fls4;for
   G=1 to 200;H[G]
   ↑2+V→V;next G

```

```

36: if fls4;if
   not bit(3,B[11])
   ;V/1.944→V

```

```

37: if fls4;if
   not bit(3,B[11])
   ;plt 1050,.25,
   1;lbl "NORMALIZ
   ED TO BETA"

```

```

38: if fls4;if
   bit(3,B[11]);
   plt 1050,.25,1;
   lbl "NORMALIZED
   PER HZ"

```

```

39: cfa 3;cfa 4;
   rV→V;plt 1150,
   .75,1;lbl V

```

```

40: if fls1;ofs
   0,-2.4

```

```

41: if fls1;if
   fls2;cfa ;jmp 2

```

```

42: ent "RECALL
   SECOND FILE#TRA
   CK#?",F,T;sto 9

```

```

43: "EXIT":wrt
   705,"in"

```

```

44: beep;ent
   "DONE FOR THE
   DAY? Y or N",F$

```

```

45: if bit(0,
   num(F$));dsp
   "SEE Y'ALL TOMO
   RROW";end

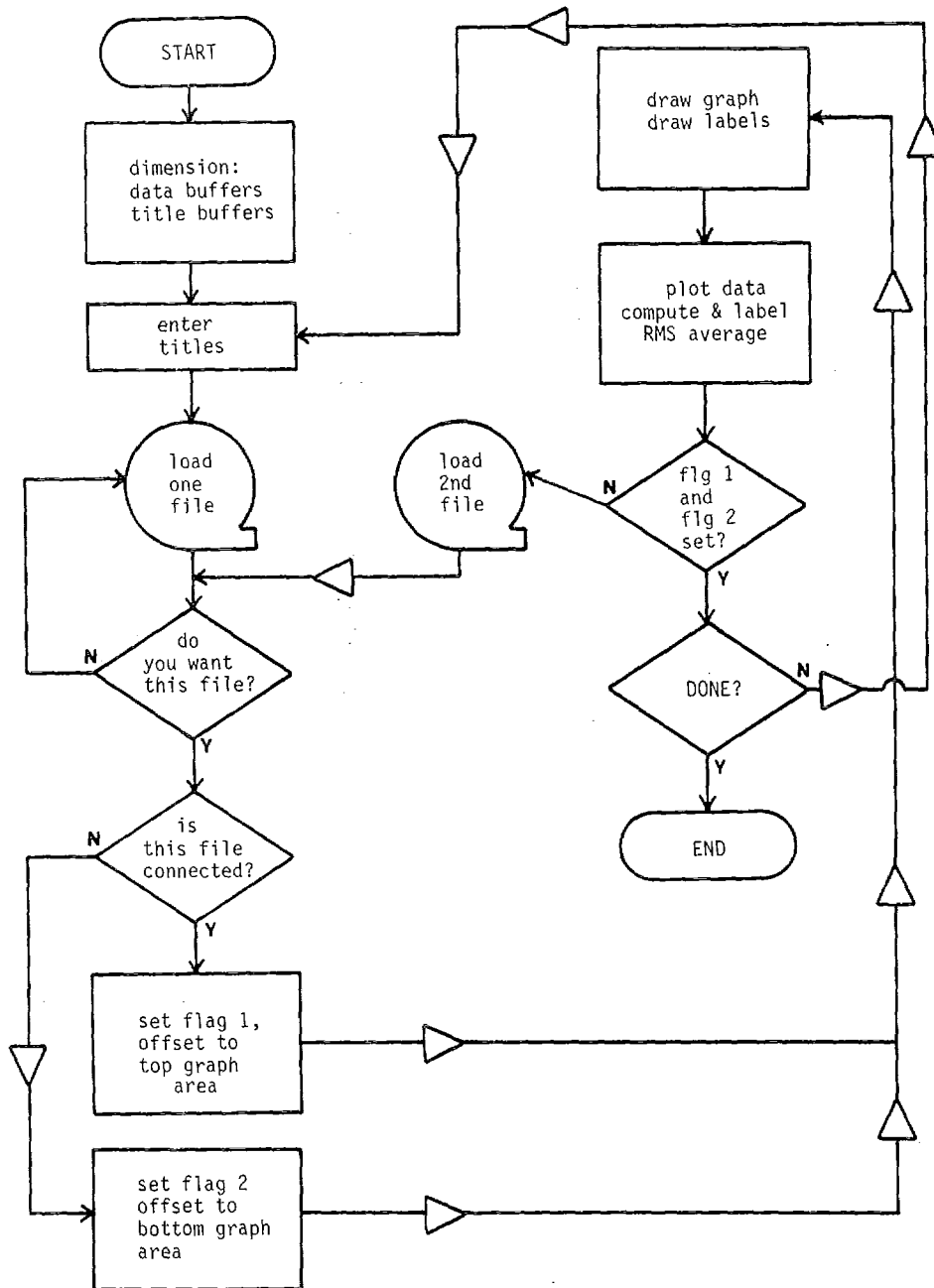
```

```

46: beep;dsp
   "CHANGE PAPER!"
   ;wait 5000;sto
   2
*3661

```

HELMETS FLOWCHART




```
0: dim R$[12],
  Q$[100],D[400],
  H[400],A[11],
  B[11]
```

```
1: dim A$[12],
  B$[100],E[200],
  F[200]
```

```
2: dim C$[12],
  D$[100],J[200],
  K[200]
```

```
3: dim E$[1],
  F$[1],G$[10],
  H$[10],I$[8],
  J$[8]
```

```
4: ent "WHICH
  AXIS TO PLOT?
  X,Y,Z",E$
```

```
5: ent "HELMET
  TYPE? FORM FIT,
  SPH4",H$
```

```
6: ent "FLIGHT
  CONDITION?",G$
```

```
7: pclr;sc1 0,
  2000,0,6;fxd 0;
  ofs 300,3;cfs
```

```
8: wrt 705,"t10,
  .5";xax 0,50,0,
  1000,20;yax 0,
  .5,-2,2,2
```

```
9: csiz 1.5,2,1,
  90;plt -75,-
  1.25;lbl "DIFFE
  RENCE IN INTENS
  ITY M/S2"
```

```
10: csiz 1.5,2,
  1;plt 150,-2.15
  ;lbl "FREQUENCY
  (TIC INTERVAL
  IS 50HZ)"
```

```
11: plt 250,-
  2.5;lbl "FIGURE
  DIFFERENC
  E IN HELMET
  ACCELERATION"
```

```
12: csiz 1.75,2,
  1;plt 1050,1.75
  ;lbl E$,"-AXIS"
```

```
13: plt 1050,
  1.5;lbl H$;plt
  1050,1.25;lbl
  G$
```

```
14: plt 1050,-
  .25;lbl "SIGHT
  CONNECTED-"
```

```
15: plt 1050,-
  .5;lbl "SIGHT
  DISCONNECTED"
```

```
16: plt 1050,-1;
  lbl "DIFFERENCE
  IN";plt 1050,-
  1.25;lbl "RMS=
  M/S2"
```

```
17: beep;ent
  "NORMALIZED TO
  BETA? Y or N",
  F$
```

```
18: if bit(0,
  num(F$));plt
  1050,-1.75;lbl
  "NORMALIZED TO
  BETA"
```

```
19: if not bit(0
  ,num(F$));plt
  1050,-1.75;lbl
  "NORMALIZED
  PER HZ"
```

```

20: beep;ent
   "RECALL FIRST
   FILE#,TRACK#?",
   F,T
21: trk T;ldf F,
   R$,Q$,D[*],H[*]
   ,A[*],B[*]
22: prt R$,Q$;
   spc 2;ent "DO
   YOU WANT THIS
   FILE? Y or N",
   F$
23: if bit(0,
   num(F$));jmp 2
24: ato 20
25: ent "IS THIS
   FILE CONNECTED
   ? Y or N",F$
26: if bit(0,
   num(F$));ato
   "copy2"
27: R$+A$;Q$+B$;
   ""+R$;""+Q$
28: for G=1 to
   200;D[G]+E[G];
   H[G]+F[G];next
   G
29: sfa 1;if
   fl=1;if fl=2;
   cfa ;ato "diffe
   r"
30: "copy2":R$+C
   $;Q$+D$;""+R$;
   ""+Q$
31: for G=1 to
   200;D[G]+J[G];
   H[G]+K[G];next
   G
32: sfa 2;if
   fl=1;if fl=2;
   cfa ;ato "diffe
   r"

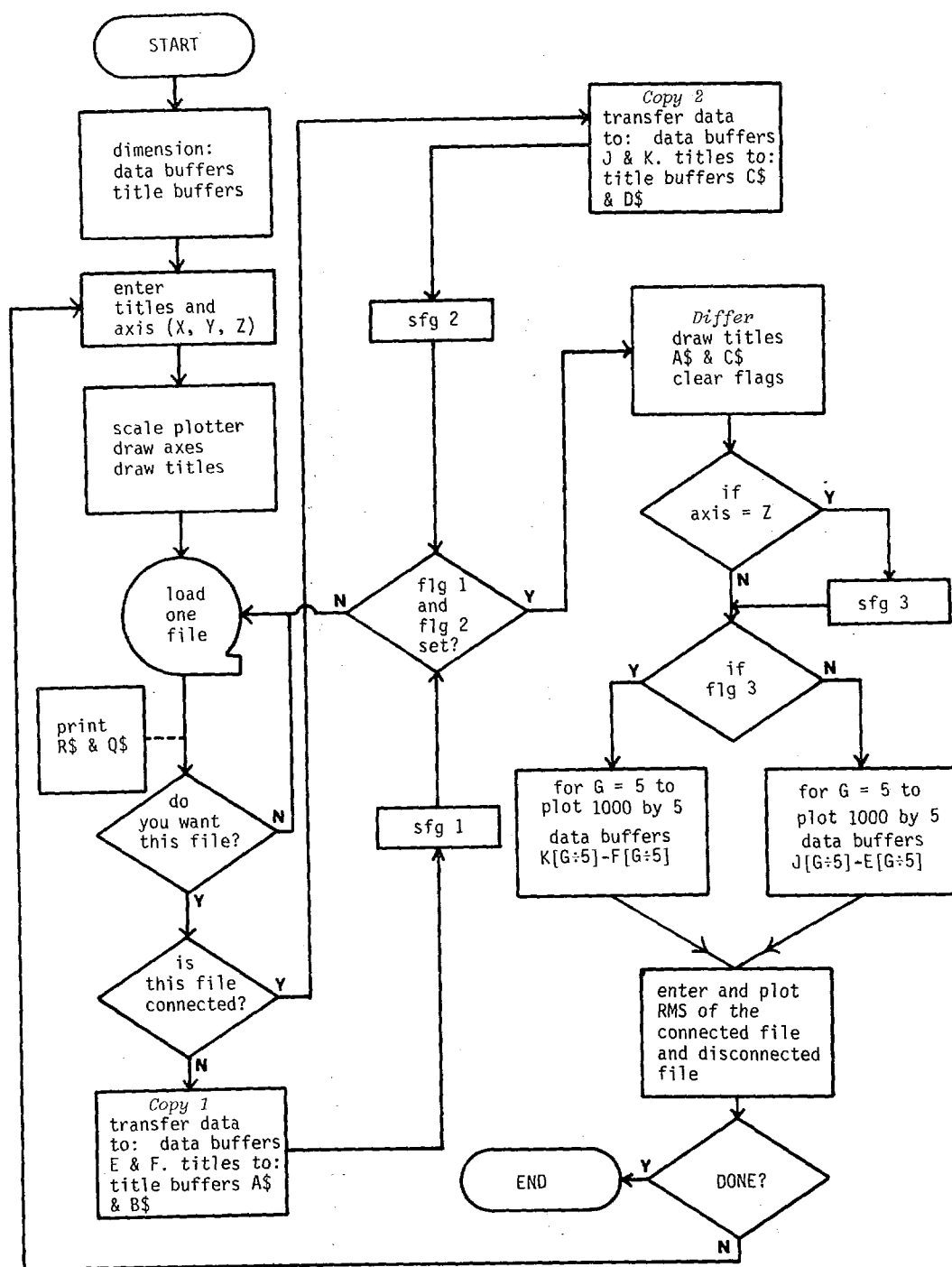
```

```

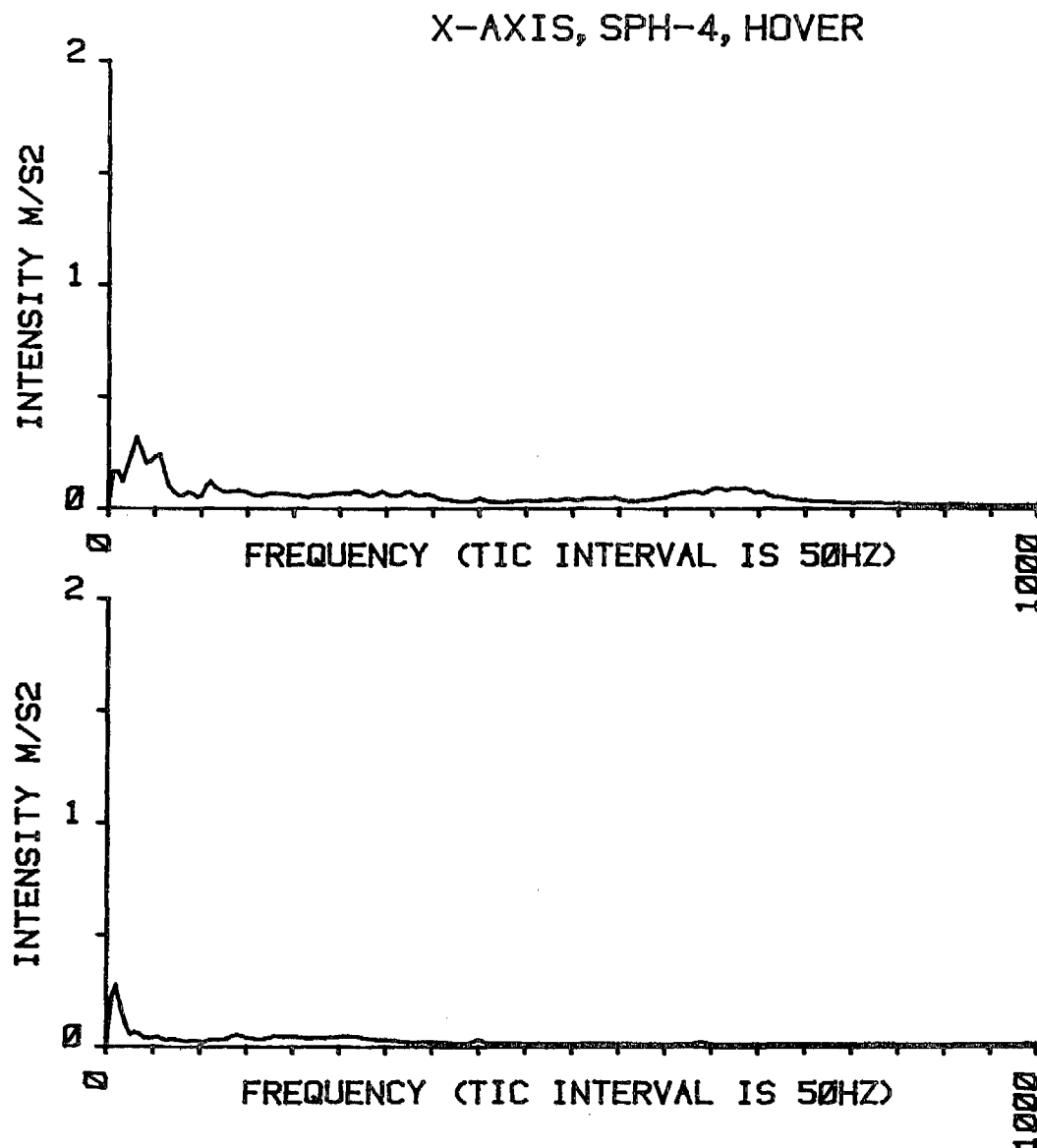
33: ent "RECALL
   SECOND FILE#,
   TRACK#?",F,T;
   ato 21
34: "differ":plt
   1050,.5;lbl
   C$,"-";plt 1050
   ,.25;lbl A$
35: if bit("10",
   num(E$));sfa 3;
   pen;plt 0,0,1
36: if not fl=3;
   for G=5 to 1000
   by 5;plt G,
   J[G/5]-E[G/5];
   next G
37: if fl=3;for
   G=5 to 1000 by
   5;plt G,K[G/5]-
   F[G/5];next G
38: beep;ent
   "ENTER RMS OF
   CONNECTED FILE"
   ,U
39: ent "ENTER
   RMS OF DISCONNE
   CTED FILE",V
40: U-V+V;fxd 5;
   plt 1150,-1.25,
   1;lbl V
41: wrt 705,"in"
   ;beep;ent "DONE
   FOR THE DAY?
   Y or N",F$
42: if bit(0,
   num(F$));dsp
   "Y'ALL COME
   BACK NOW, HEAR"
   ;end
43: beep;dsp
   "CHANGE PAPER";
   wait 5000;ato 4
   *28899

```

DIFFERGRAPH FLOWCHART



APPENDIX C
HELMET ACCELERATION SPECTRA



SIGHT CONNECTED

008.0712791

RMS= 0.75466 M/S2

NORMALIZED TO BETA

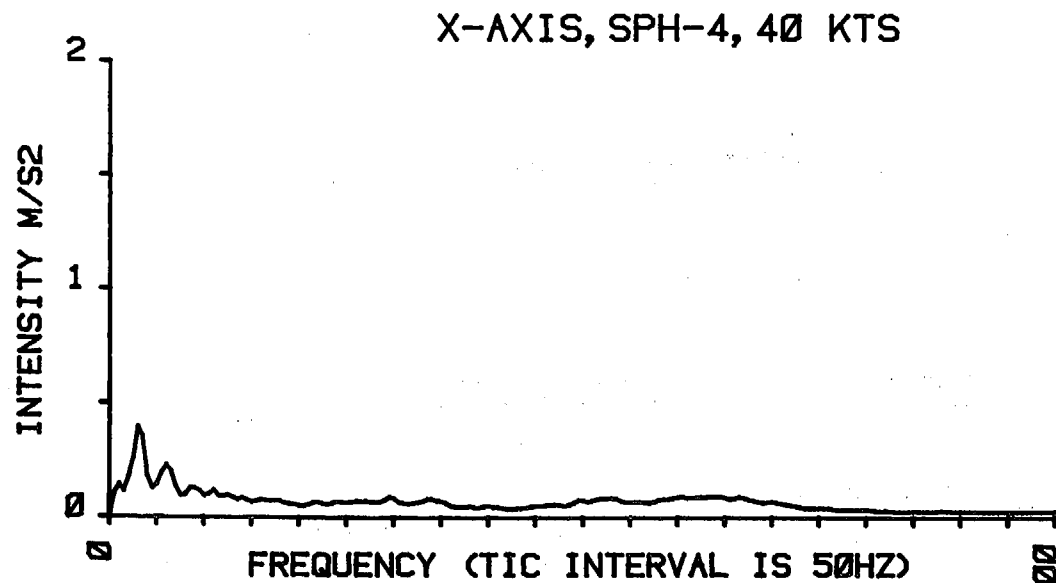
SIGHT DISCONNECTED

010.0712791

RMS= 0.37520 M/S2

NORMALIZED TO BETA

FIGURE 01. HELMET ACCELERATION

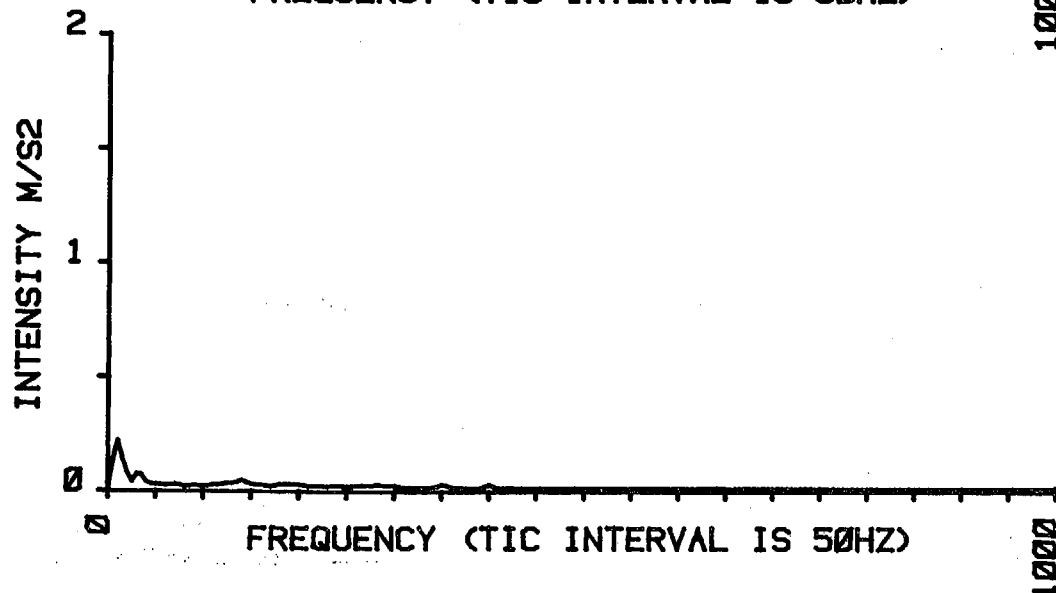


SIGHT CONNECTED

003. 0612790

RMS= 0.85209 M/S²

NORMALIZED TO BETA



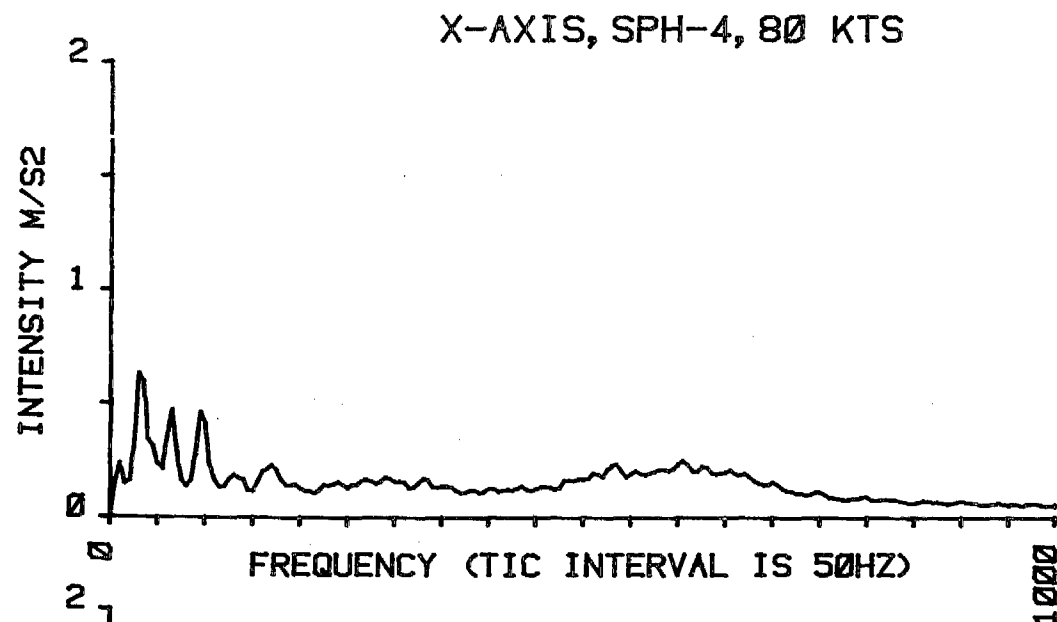
SIGHT DISCONNECTED

004. 0612790

RMS= 0.29734 M/S²

NORMALIZED TO BETA

FIGURE C2. HELMET ACCELERATION

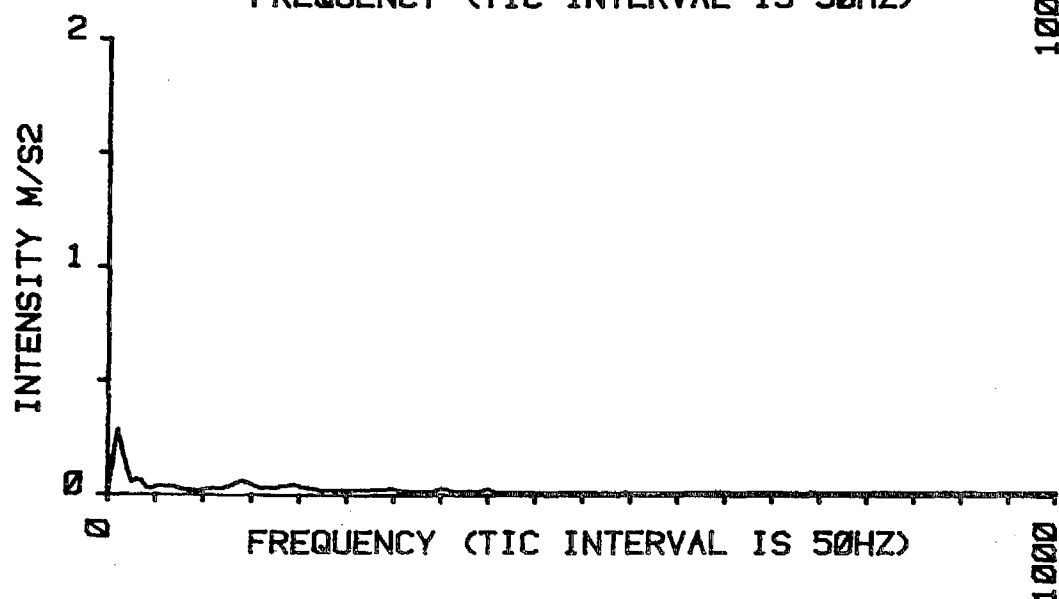


SIGHT CONNECTED

005.0612790

RMS= 1.76160 M/S²

NORMALIZED TO BETA



SIGHT DISCONNECTED

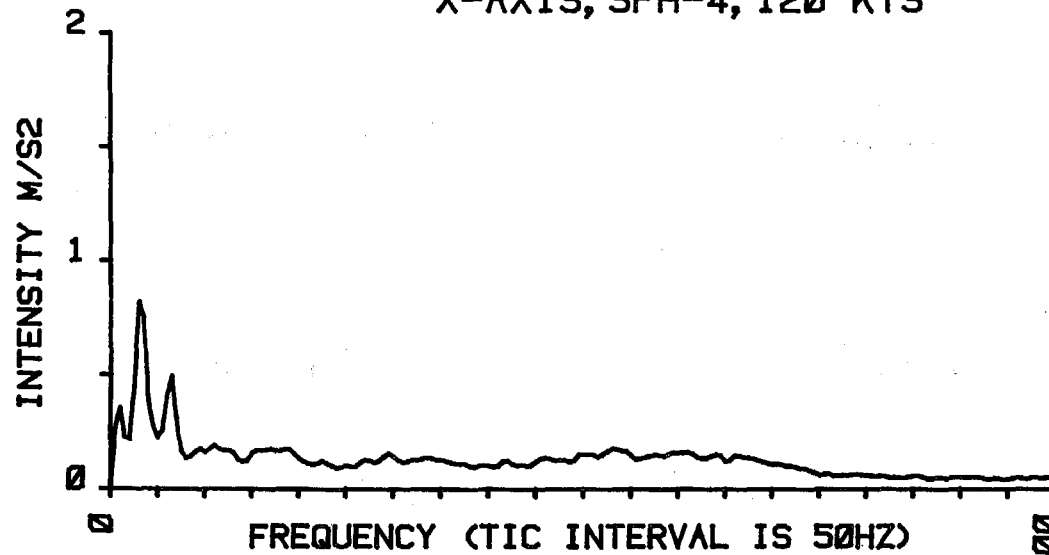
006.0612790

RMS= 0.35943 M/S²

NORMALIZED TO BETA

FIGURE C3. HELMET ACCELERATION

X-AXIS, SPH-4, 120 KTS

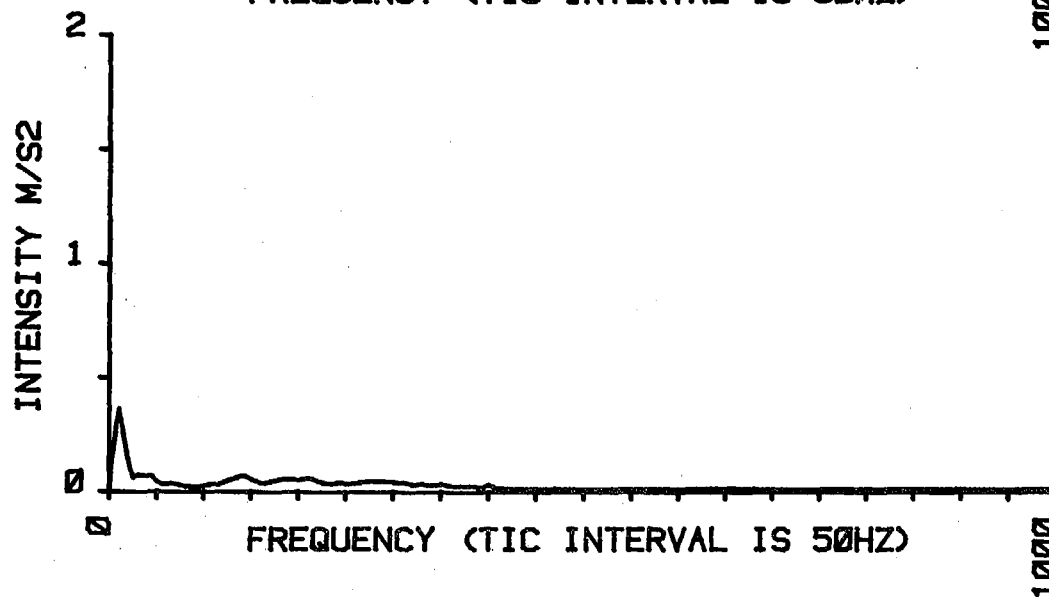


SIGHT CONNECTED

007.0612790

RMS= 1.64111 M/S2

NORMALIZED TO BETA



SIGHT DISCONNECTED

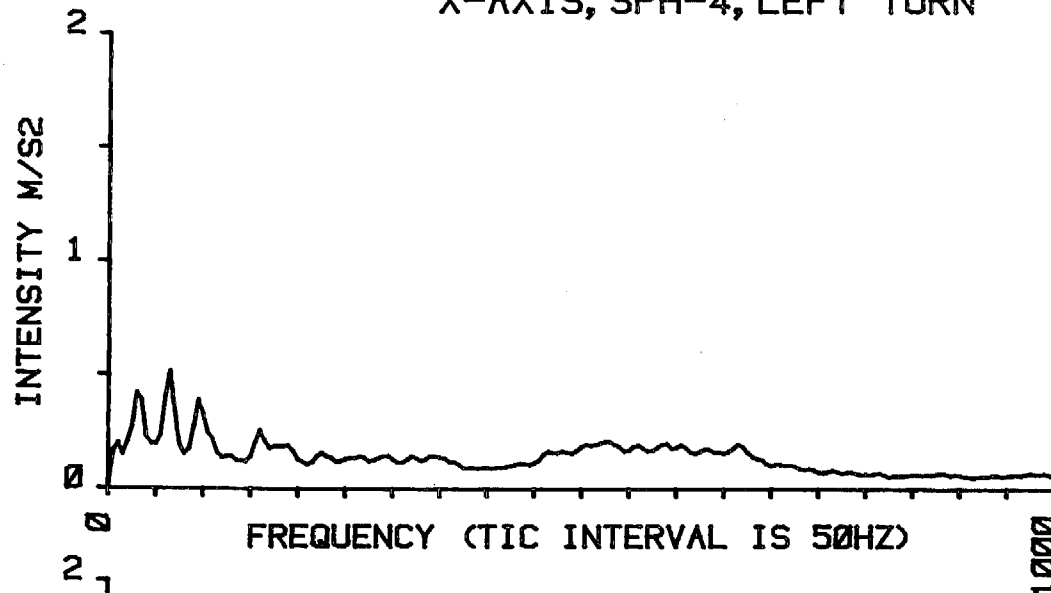
008.0612790

RMS= 0.46822 M/S2

NORMALIZED TO BETA

FIGURE C4. HELMET ACCELERATION

X-AXIS, SPH-4, LEFT TURN

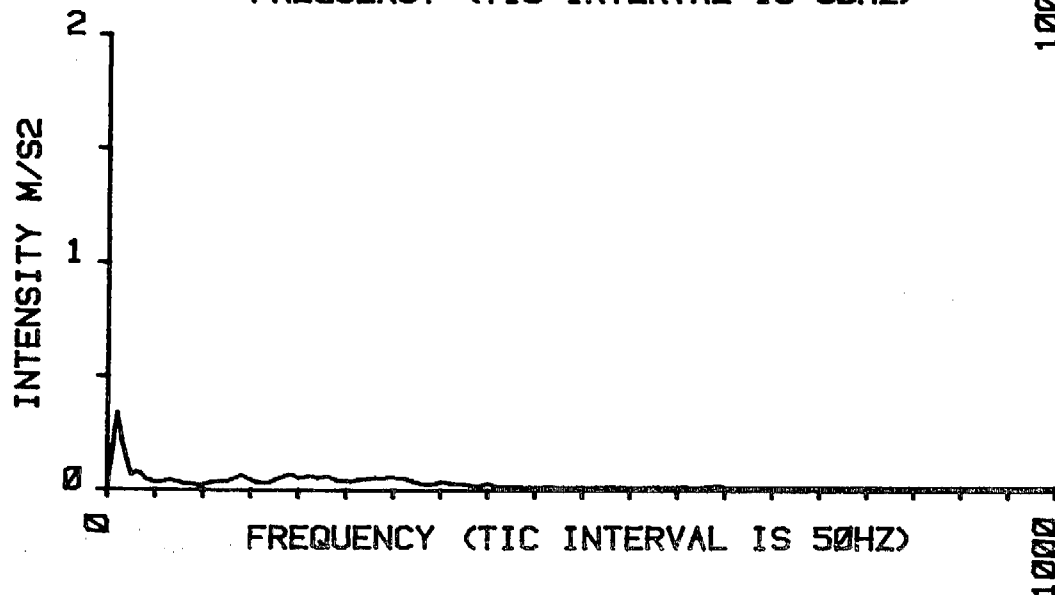


SIGHT CONNECTED

009.0612790

RMS= 1.58976 M/S2

NORMALIZED TO BETA



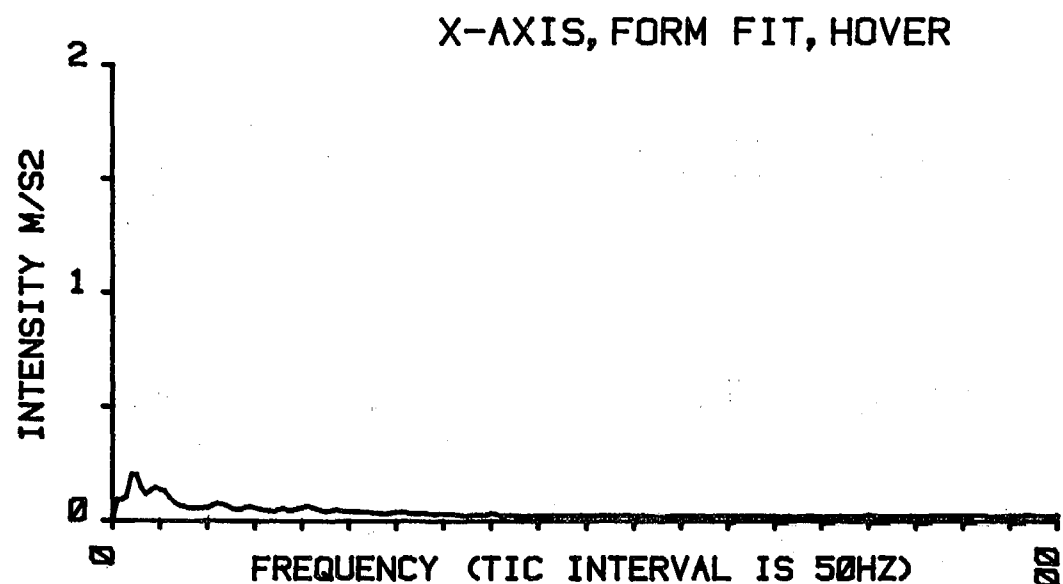
SIGHT DISCONNECTED

010.0612790

RMS= 0.44839 M/S2

NORMALIZED TO BETA

FIGURE C5. HELMET ACCELERATION

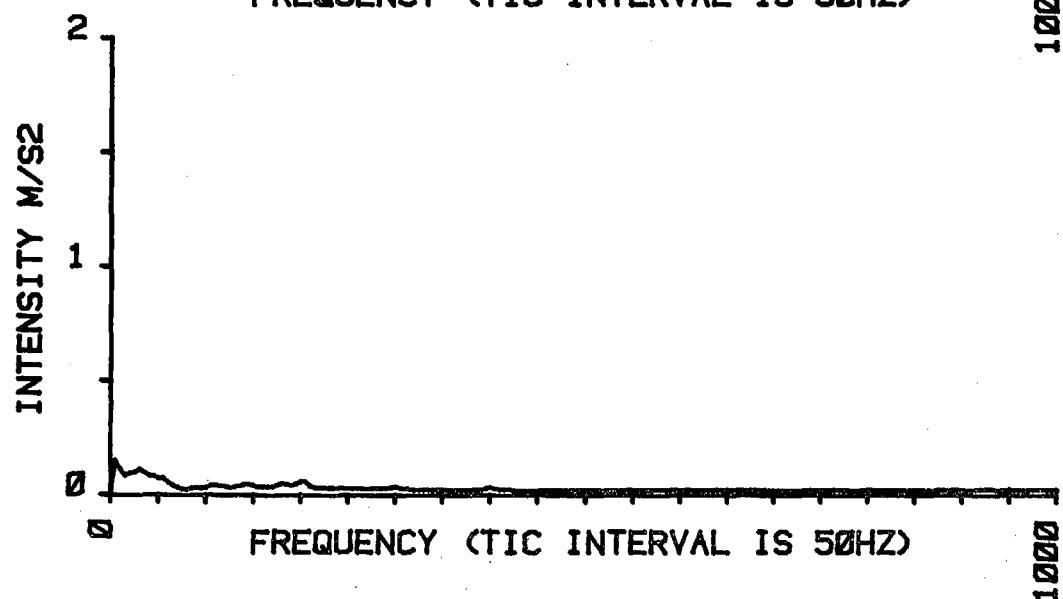


SIGHT CONNECTED

002.1012790

RMS= 0.48323 M/S2

NORMALIZED TO BETA



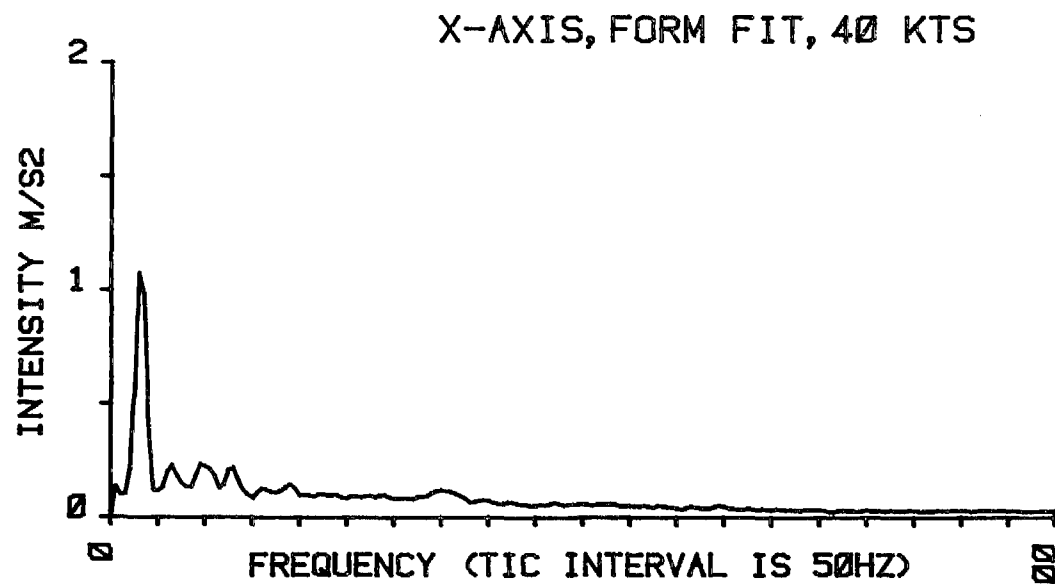
SIGHT DISCONNECTED

003.1012790

RMS= 0.35470 M/S2

NORMALIZED TO BETA

FIGURE 06. HELMET ACCELERATION

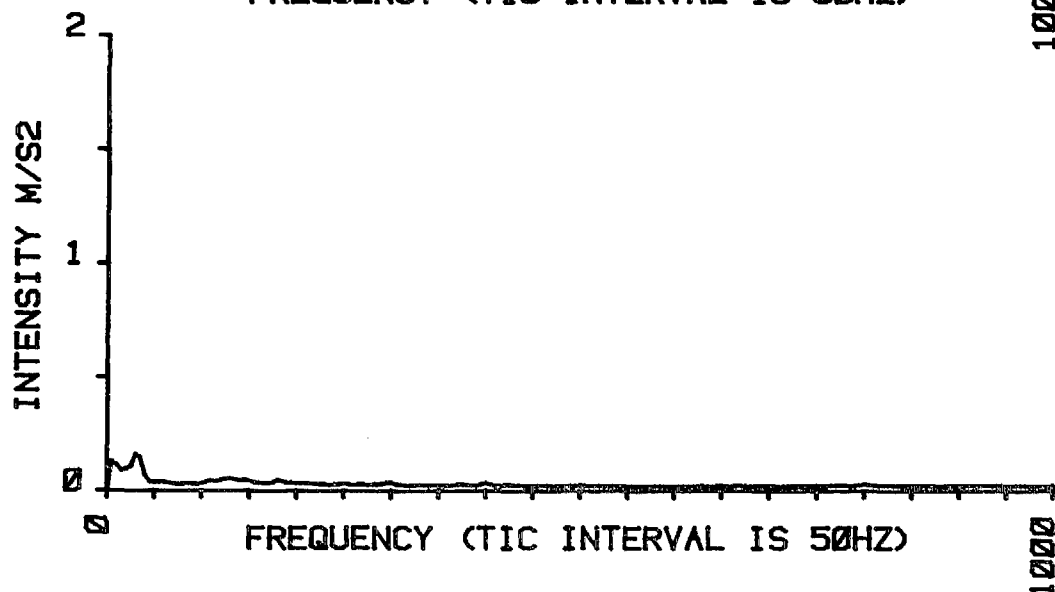


SIGHT CONNECTED

004.1012790

RMS= 1.44788 M/S²

NORMALIZED TO BETA



SIGHT DISCONNECTED

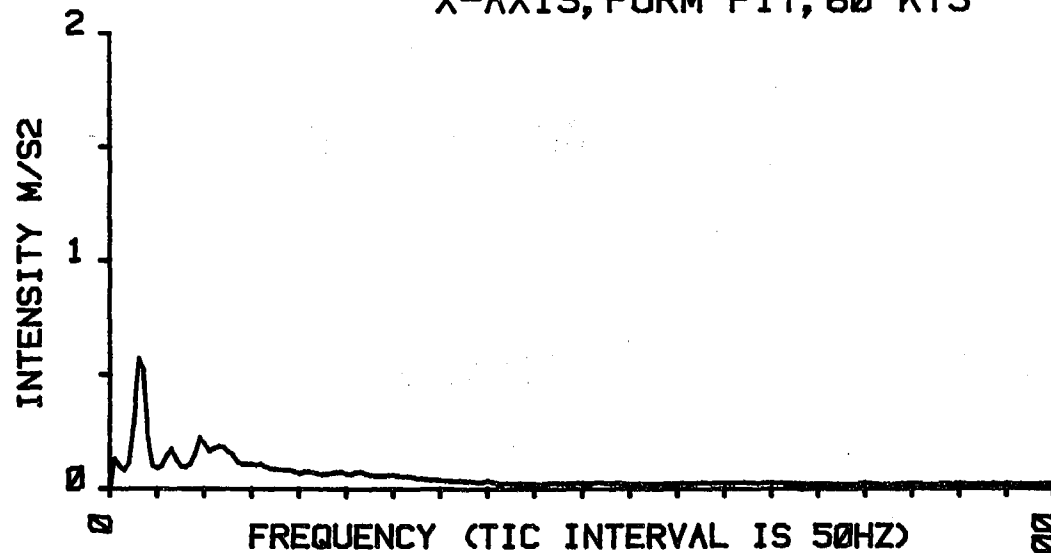
005.1012790

RMS= 0.35916 M/S²

NORMALIZED TO BETA

FIGURE 07. HELMET ACCELERATION

X-AXIS, FORM FIT, 80 KTS

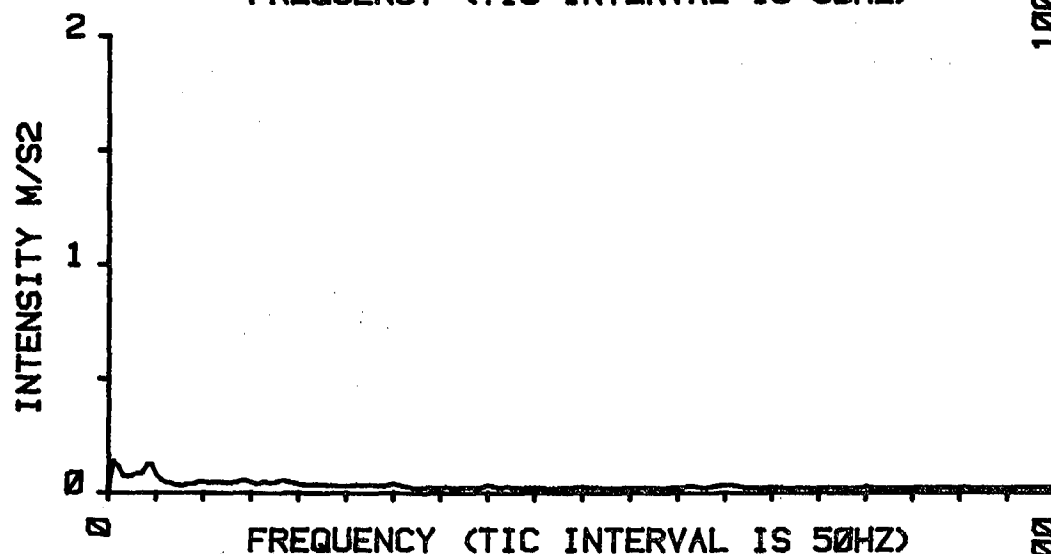


SIGHT CONNECTED

008.1012790

RMS= 0.88968 M/S2

NORMALIZED TO BETA



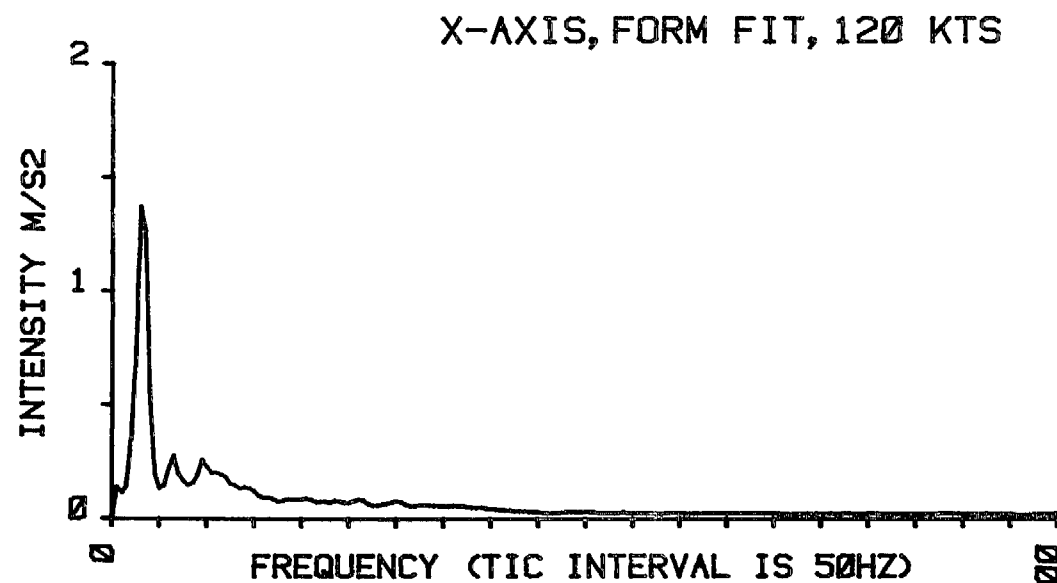
SIGHT DISCONNECTED

009.1012790

RMS= 0.36969 M/S2

NORMALIZED TO BETA

FIGURE C8. HELMET ACCELERATION

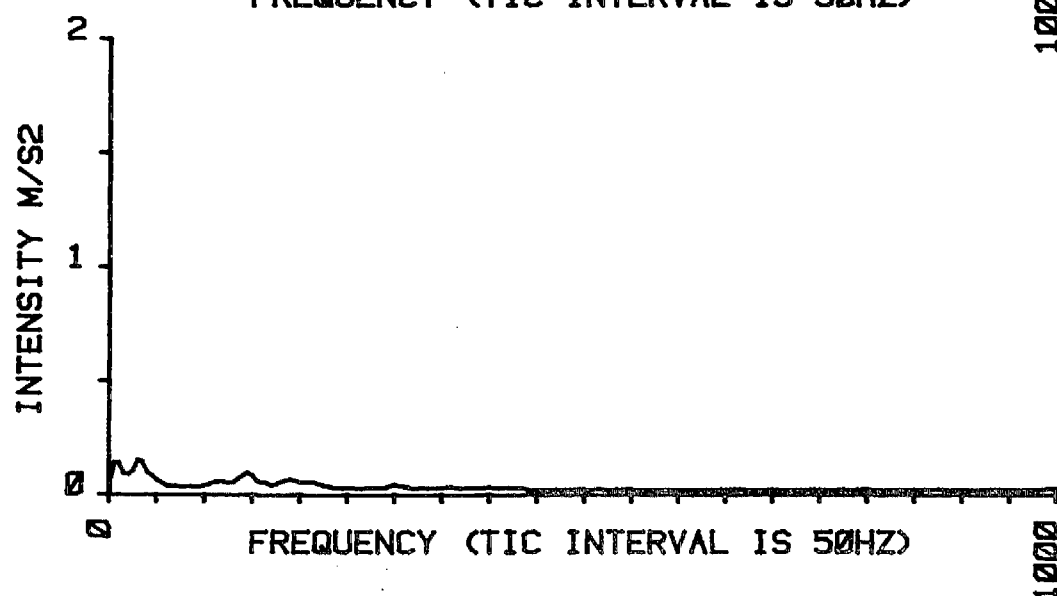


SIGHT CONNECTED

Ø1Ø.1Ø1279Ø

RMS= 1.69Ø56 M/S2

NORMALIZED TO BETA



SIGHT DISCONNECTED

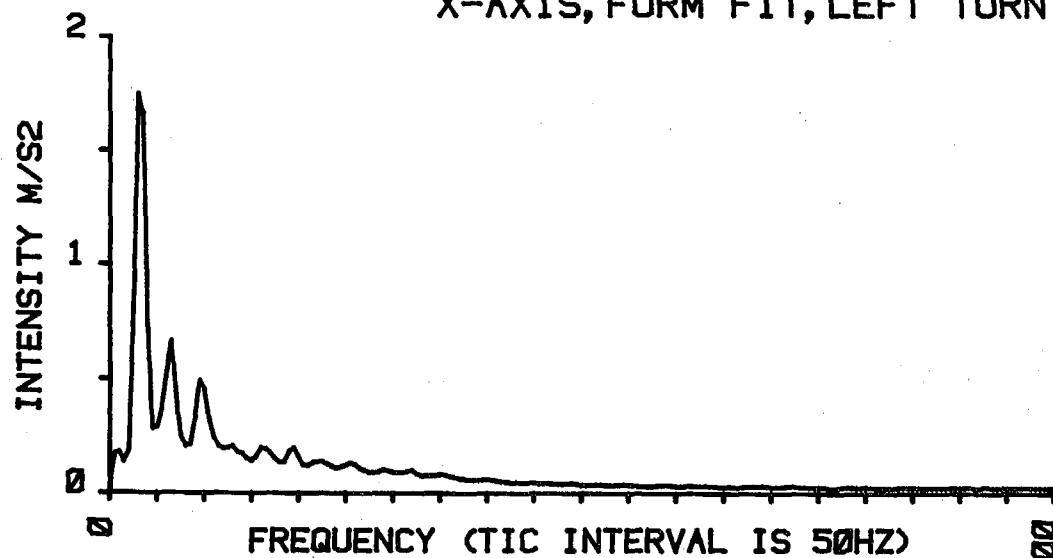
Ø11.1Ø1279Ø

RMS= Ø.41699 M/S2

NORMALIZED TO BETA

FIGURE C9. HELMET ACCELERATION

X-AXIS, FORM FIT, LEFT TURN

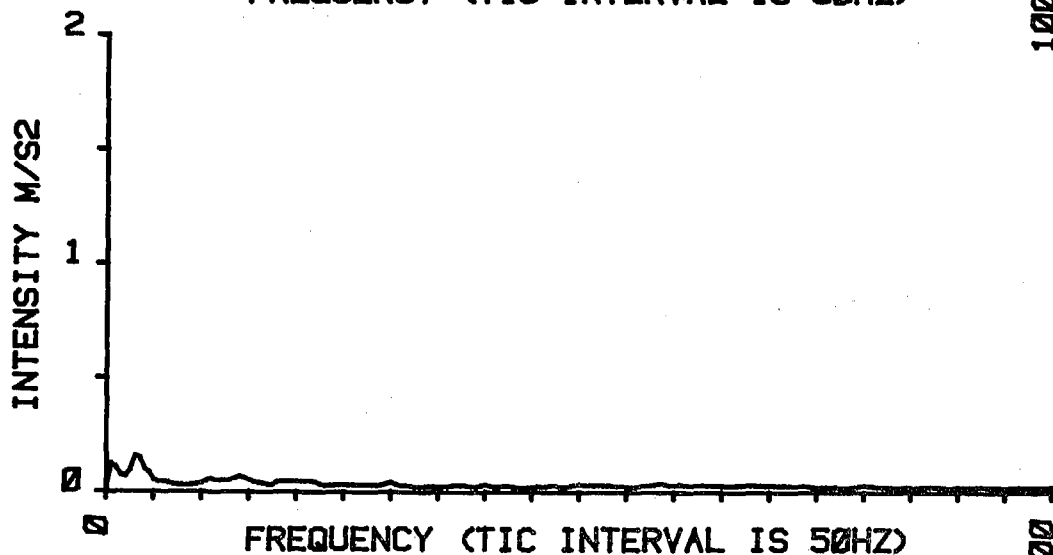


SIGHT CONNECTED

012.1012790

RMS= 2.30703 M/S2

NORMALIZED TO BETA



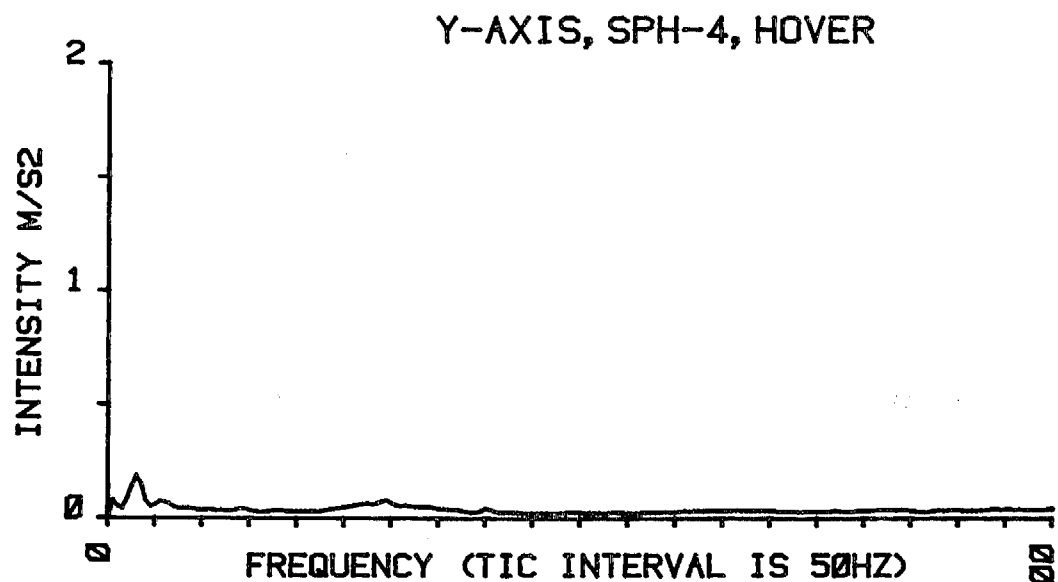
SIGHT DISCONNECTED

013.1012790

RMS= 0.39302 M/S2

NORMALIZED TO BETA

FIGURE C10. HELMET ACCELERATION

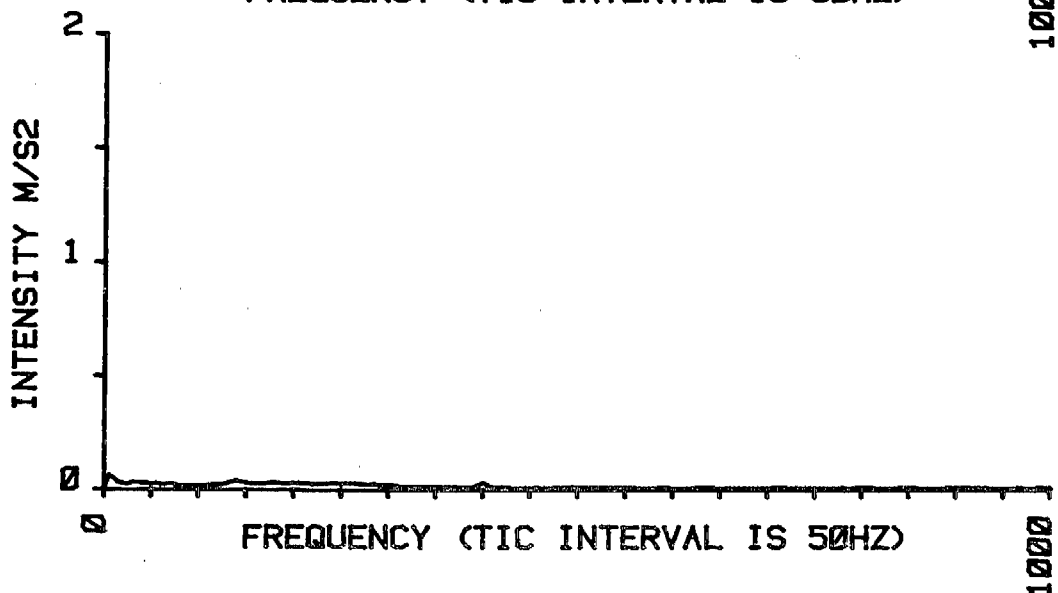


SIGHT CONNECTED

001.1606800

RMS= 0.44230 M/S2

NORMALIZED TO BETA



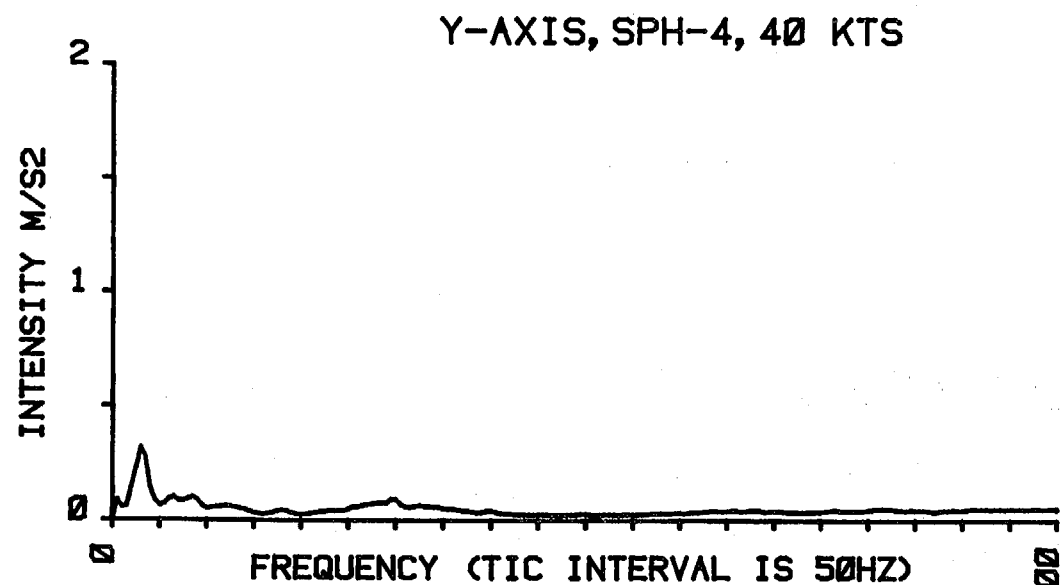
SIGHT DISCONNECTED

002.1606800

RMS= 0.17778 M/S2

NORMALIZED TO BETA

FIGURE C11. HELMET ACCELERATION

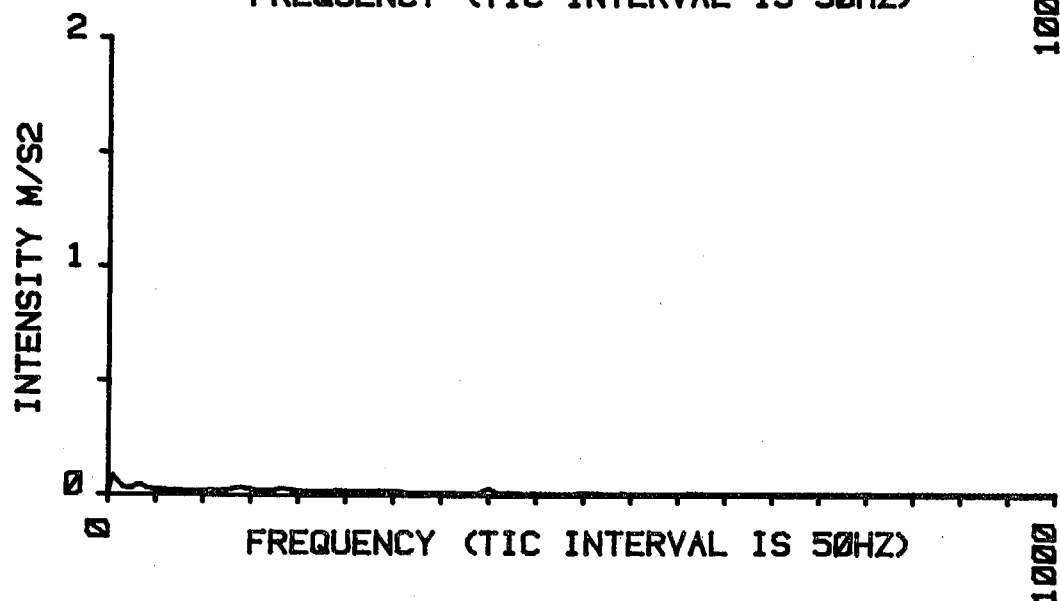


SIGHT CONNECTED

003.1606800

RMS= 0.61447 M/S²

NORMALIZED TO BETA



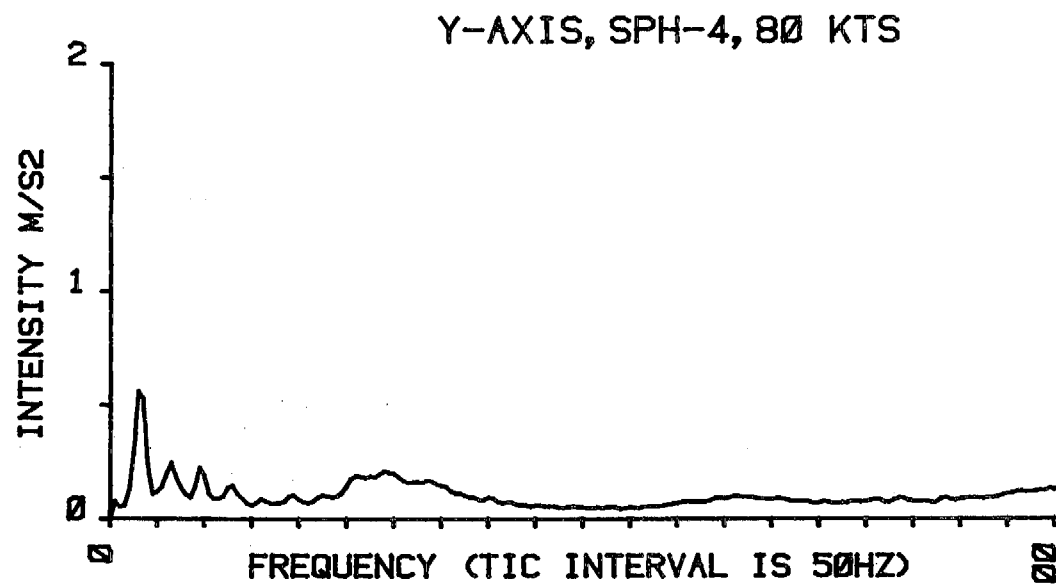
SIGHT DISCONNECTED

004.1606800

RMS= 0.16719 M/S²

NORMALIZED TO BETA

FIGURE C12. HELMET ACCELERATION

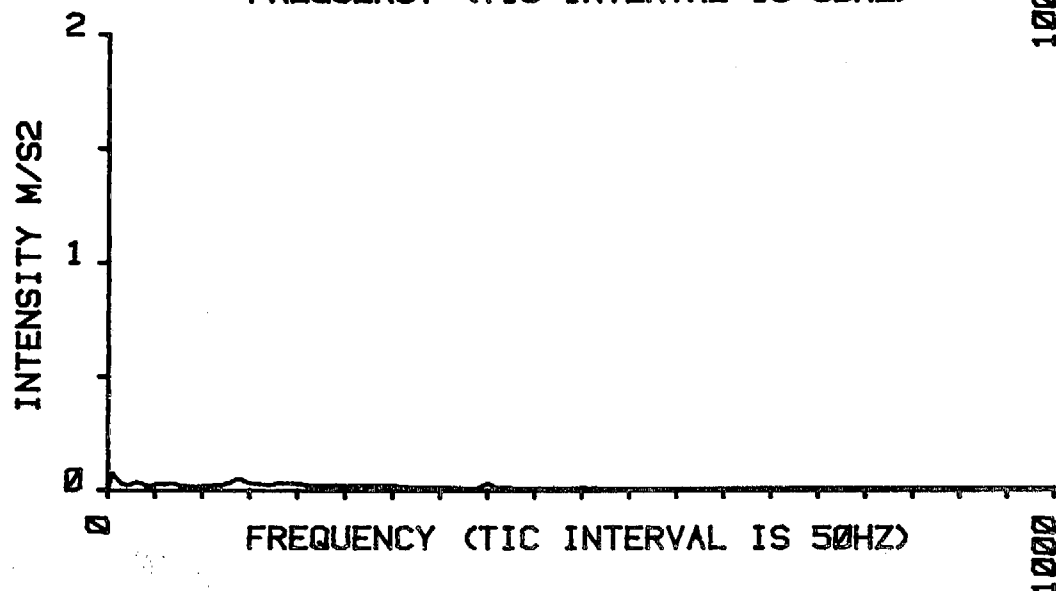


SIGHT CONNECTED

005.1606800

RMS= 1.21277 M/S²

NORMALIZED TO BETA



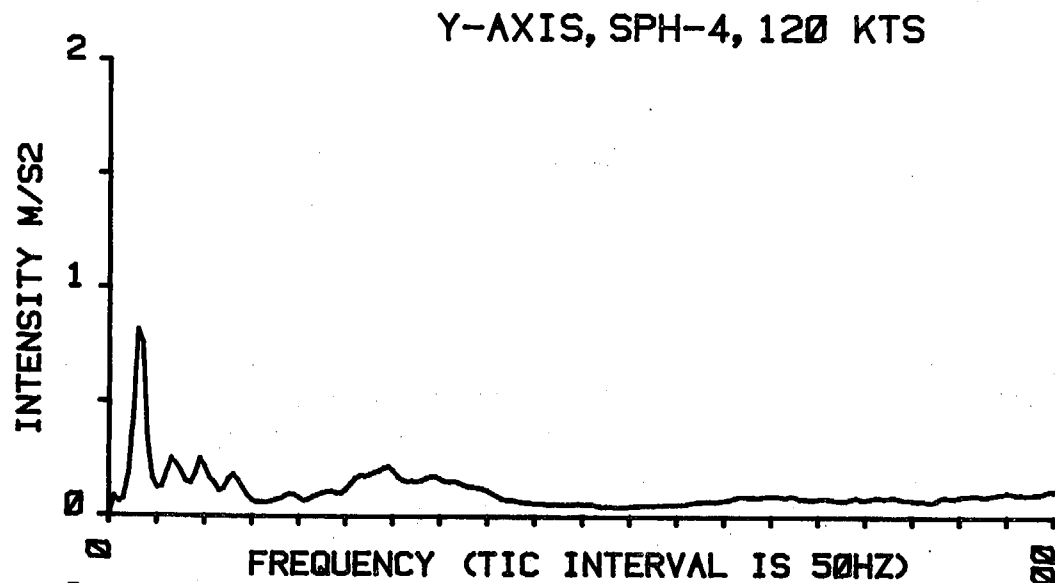
SIGHT DISCONNECTED

006.1606800

RMS= 0.17695 M/S²

NORMALIZED TO BETA

FIGURE C13. HELMET ACCELERATION

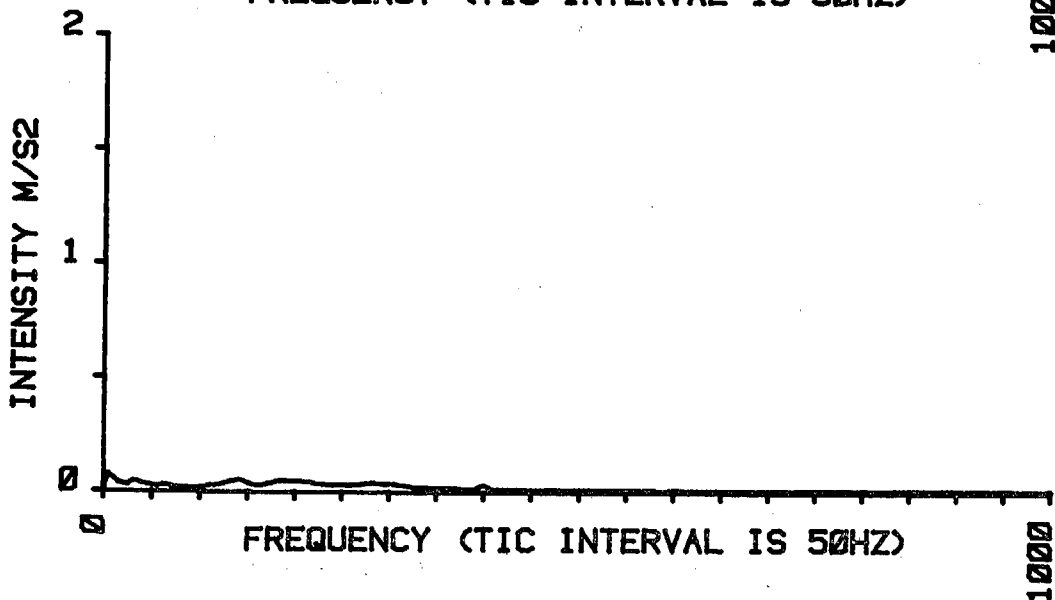


SIGHT CONNECTED

007.1606800

RMS= 1.42111 M/S2

NORMALIZED TO BETA



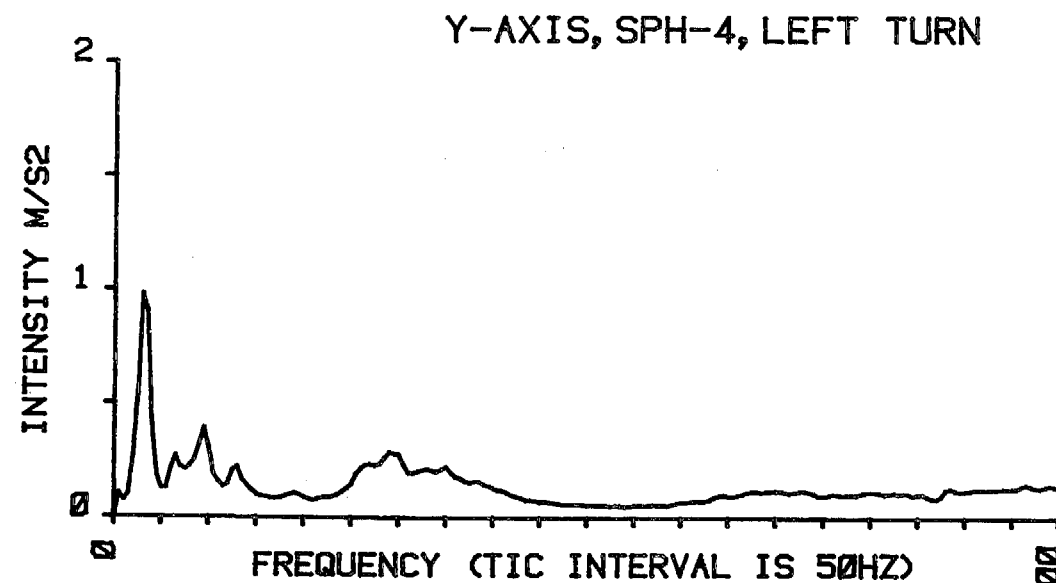
SIGHT DISCONNECTED

008.1606800

RMS= 0.23235 M/S2

NORMALIZED TO BETA

FIGURE C14. HELMET ACCELERATION

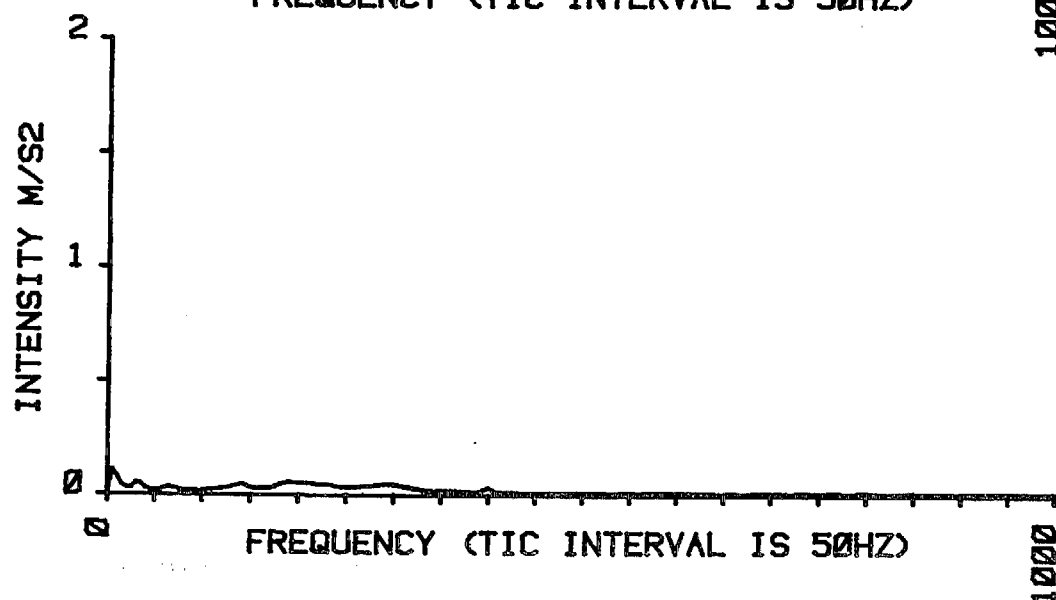


SIGHT CONNECTED

009.1606800

RMS= 1.76677 M/S2

NORMALIZED TO BETA



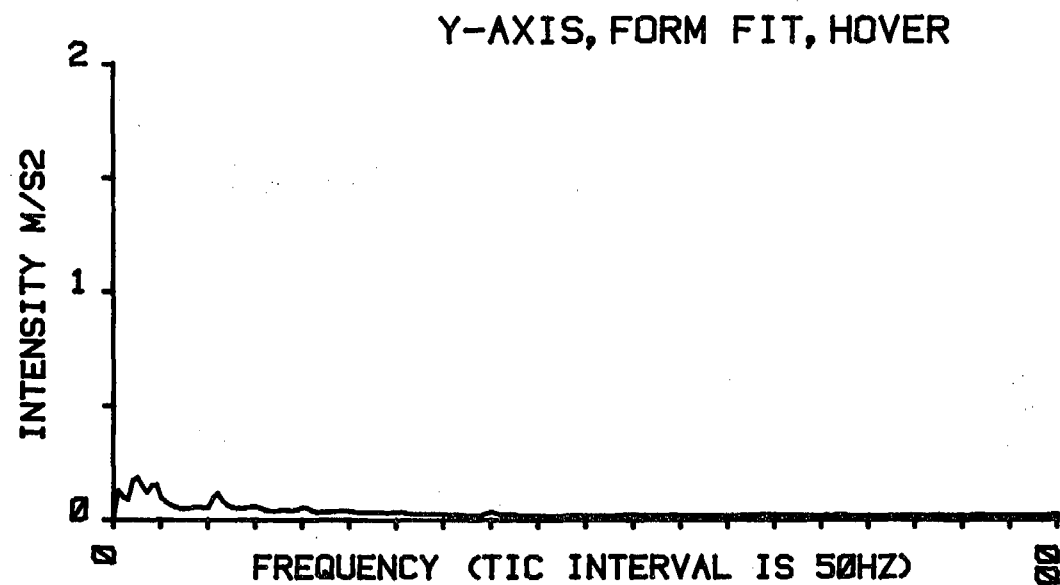
SIGHT DISCONNECTED

010.1606800

RMS= 0.25591 M/S2

NORMALIZED TO BETA

FIGURE C15. HELMET ACCELERATION

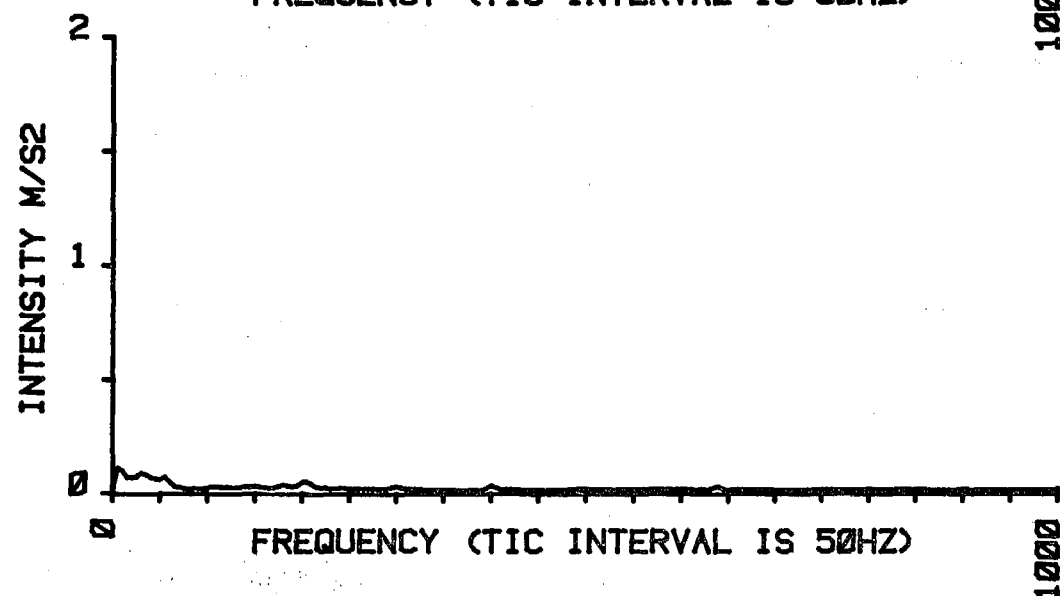


SIGHT CONNECTED

002.1706800

RMS= 0.44955 M/S2

NORMALIZED TO BETA



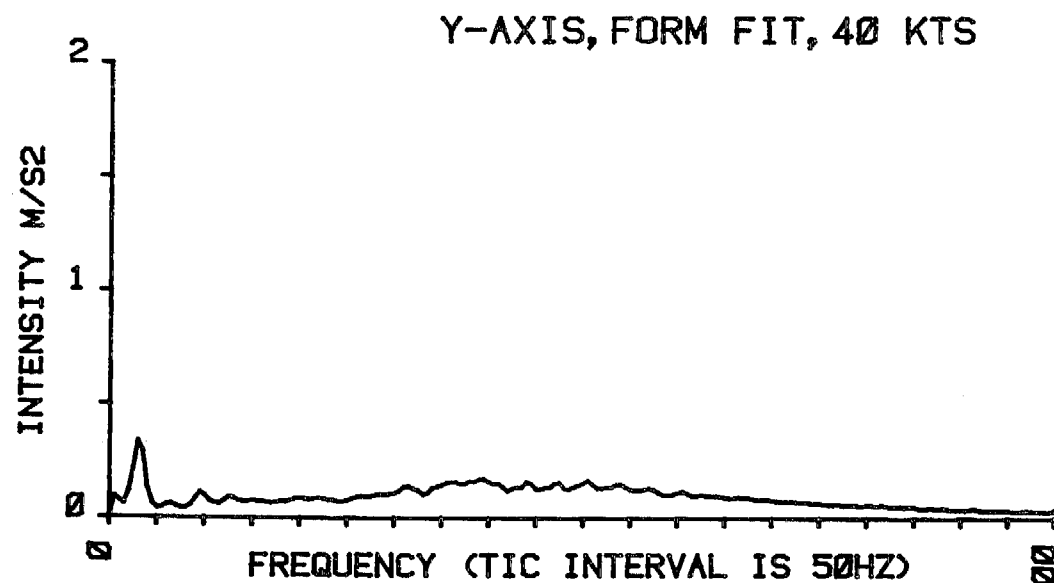
SIGHT DISCONNECTED

003.1706800

RMS= 0.29448 M/S2

NORMALIZED TO BETA

FIGURE C16. HELMET ACCELERATION

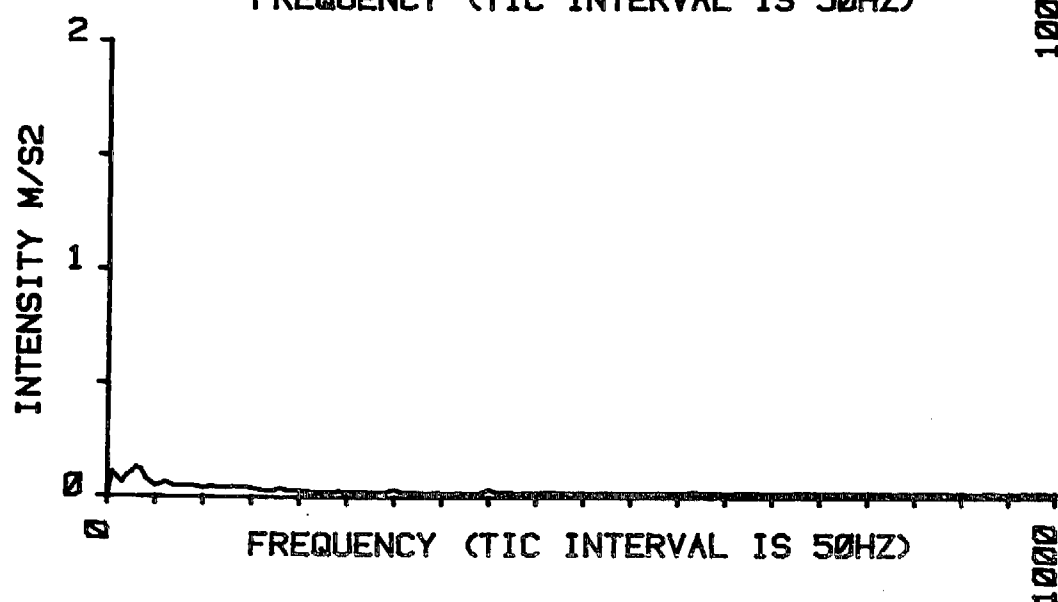


SIGHT CONNECTED

004.1706800

RMS= 1.04494 M/S2

NORMALIZED TO BETA



SIGHT DISCONNECTED

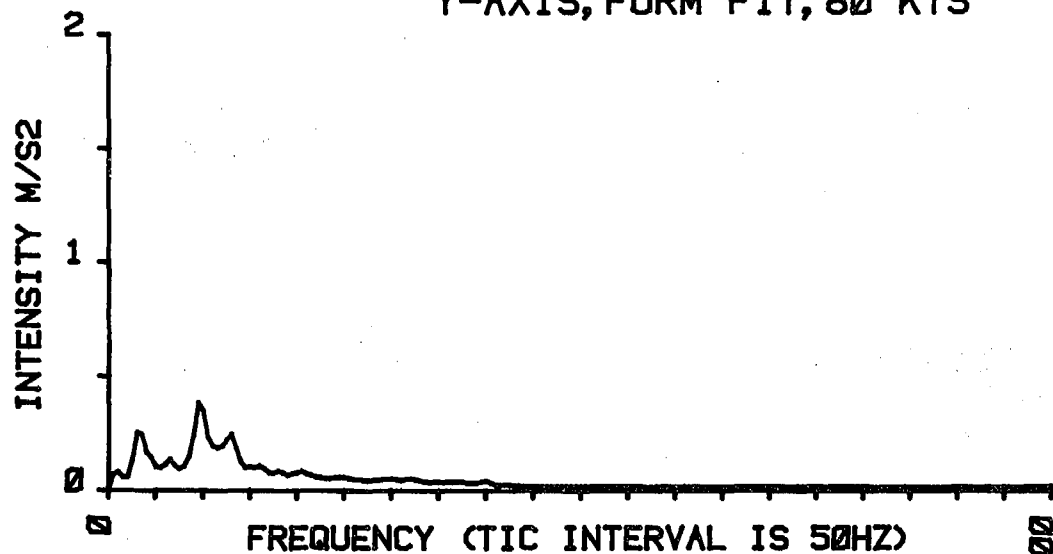
005.1706800

RMS= 0.32260 M/S2

NORMALIZED TO BETA

FIGURE C17. HELMET ACCELERATION

Y-AXIS, FORM FIT, 80 KTS

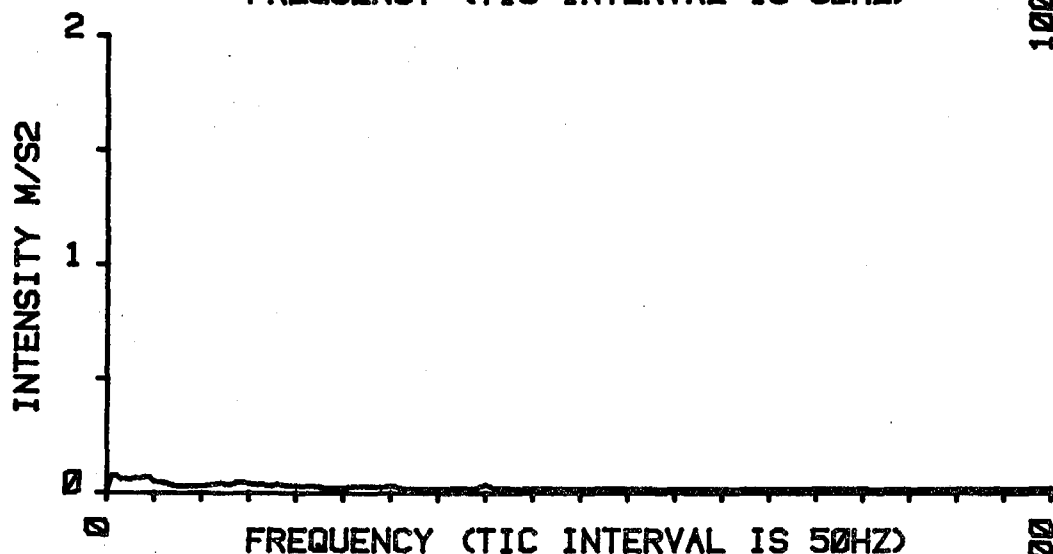


SIGHT CONNECTED

008.1706800

RMS= 0.79133 M/S2

NORMALIZED TO BETA



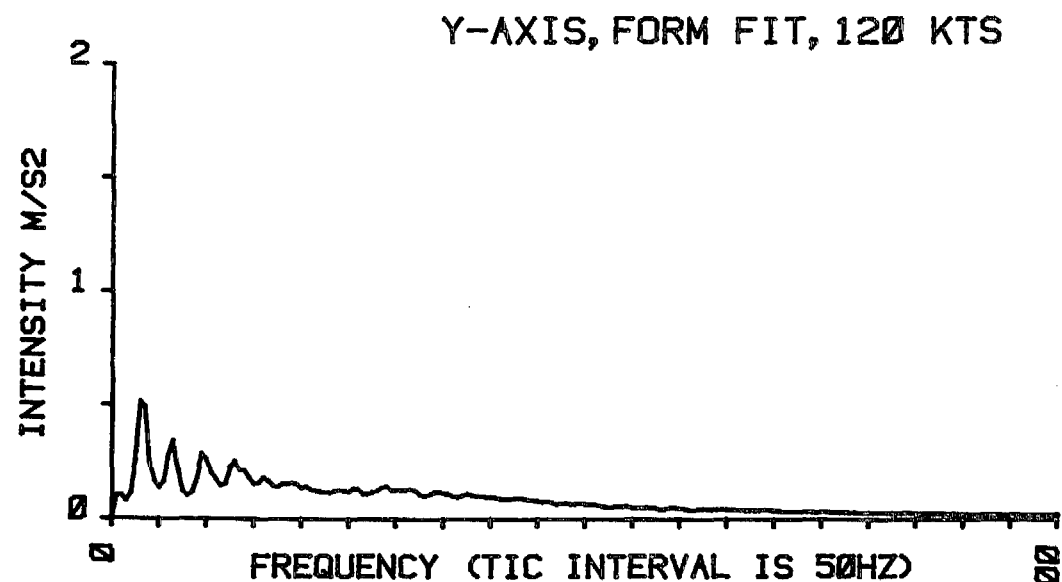
SIGHT DISCONNECTED

009.1706800

RMS= 0.27315 M/S2

NORMALIZED TO BETA

FIGURE C18. HELMET ACCELERATION

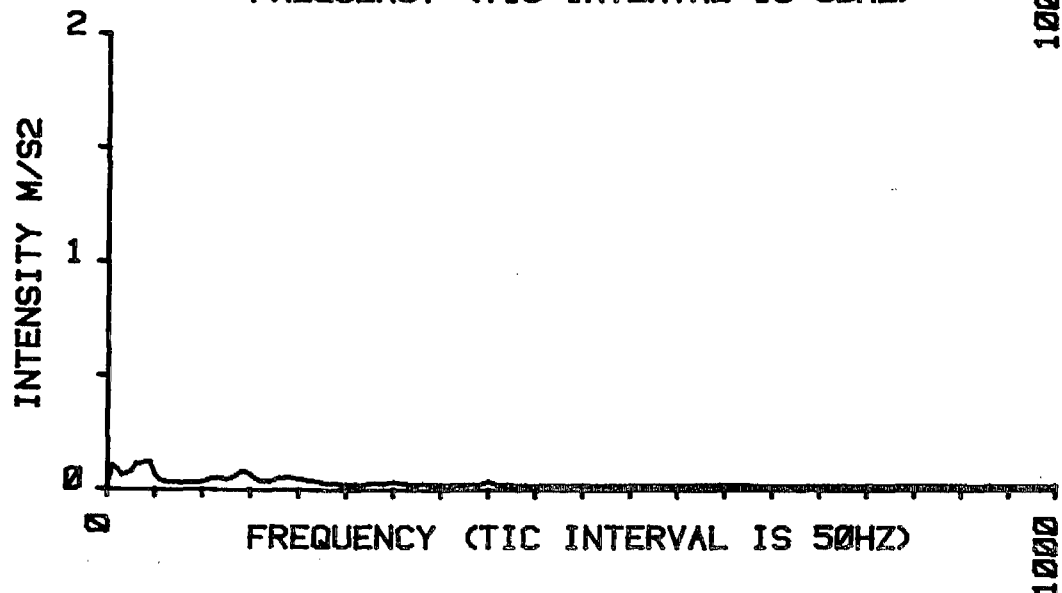


SIGHT CONNECTED

010.1706800

RMS= 1.17285 M/S2

NORMALIZED TO BETA



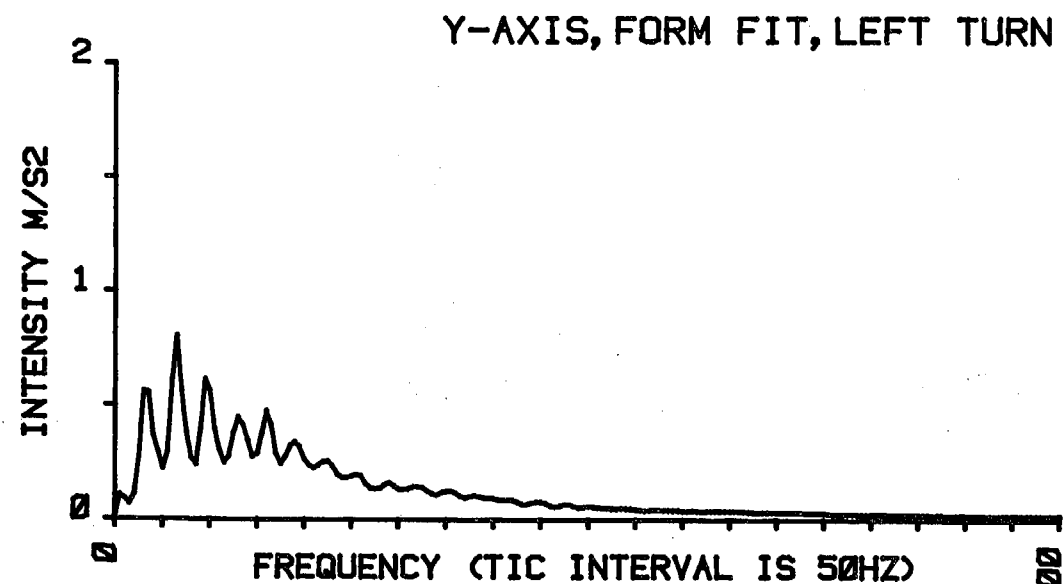
SIGHT DISCONNECTED

011.1706800

RMS= 0.34842 M/S2

NORMALIZED TO BETA

FIGURE C19. HELMET ACCELERATION

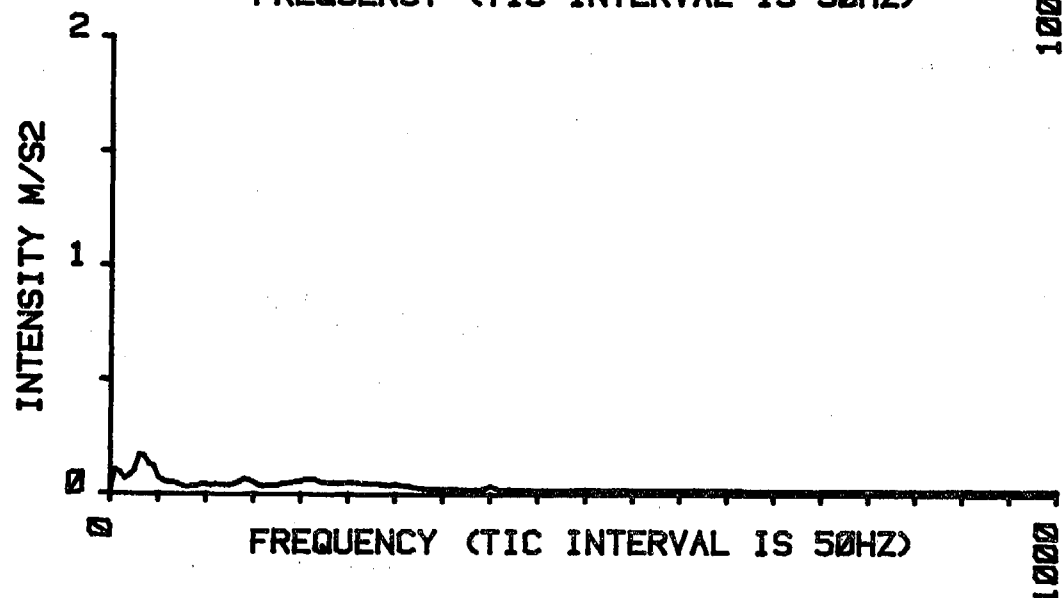


SIGHT CONNECTED

012. 1706800

RMS= 1.91915 M/S²

NORMALIZED TO BETA



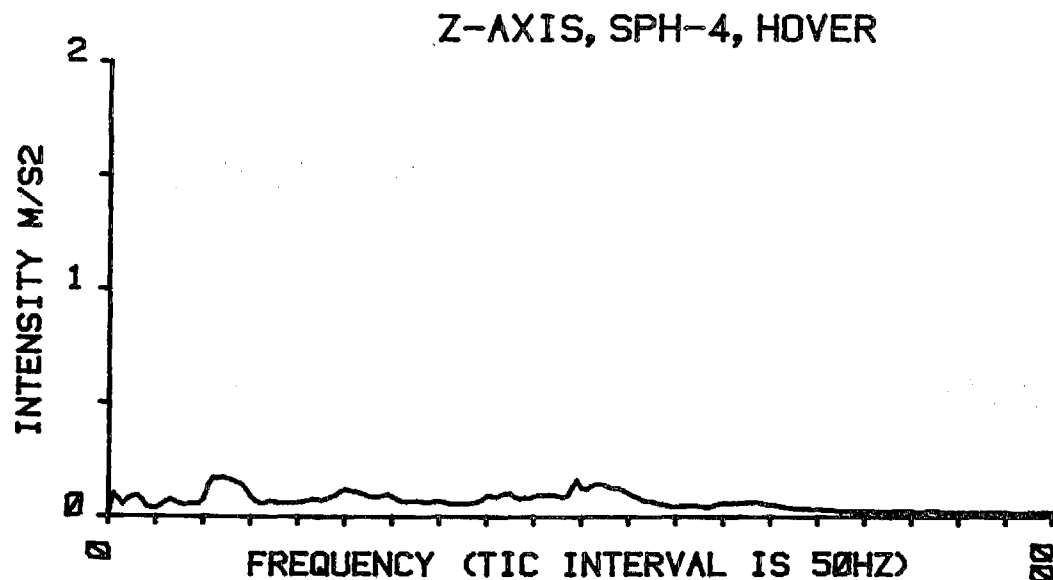
SIGHT DISCONNECTED

013. 1706800

RMS= 0.39435 M/S²

NORMALIZED TO BETA

FIGURE C20. HELMET ACCELERATION

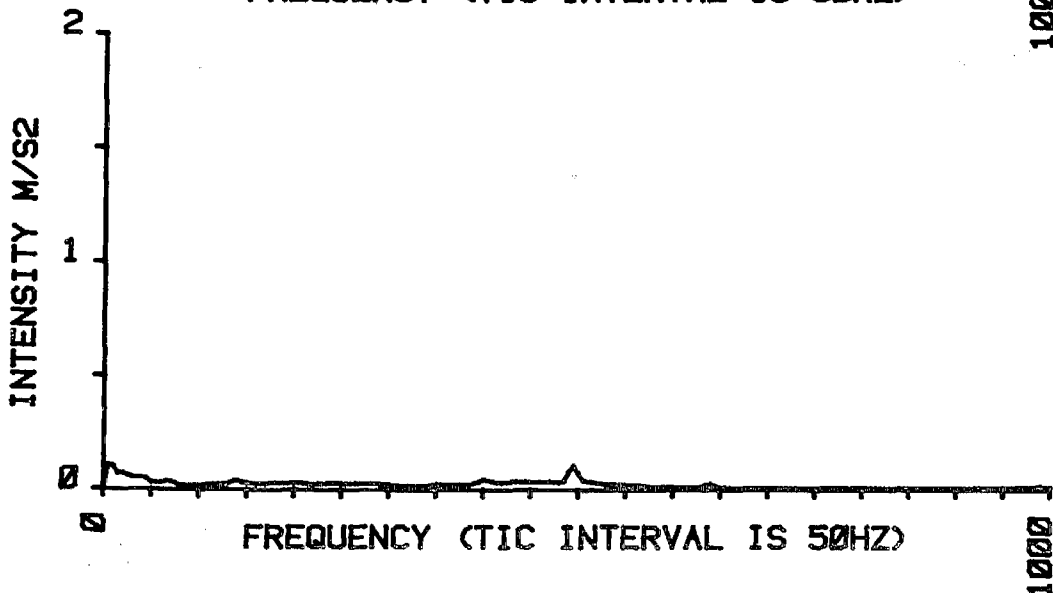


SIGHT CONNECTED

001.1606800

RMS= 0.76511 M/S²

NORMALIZED TO BETA



SIGHT DISCONNECTED

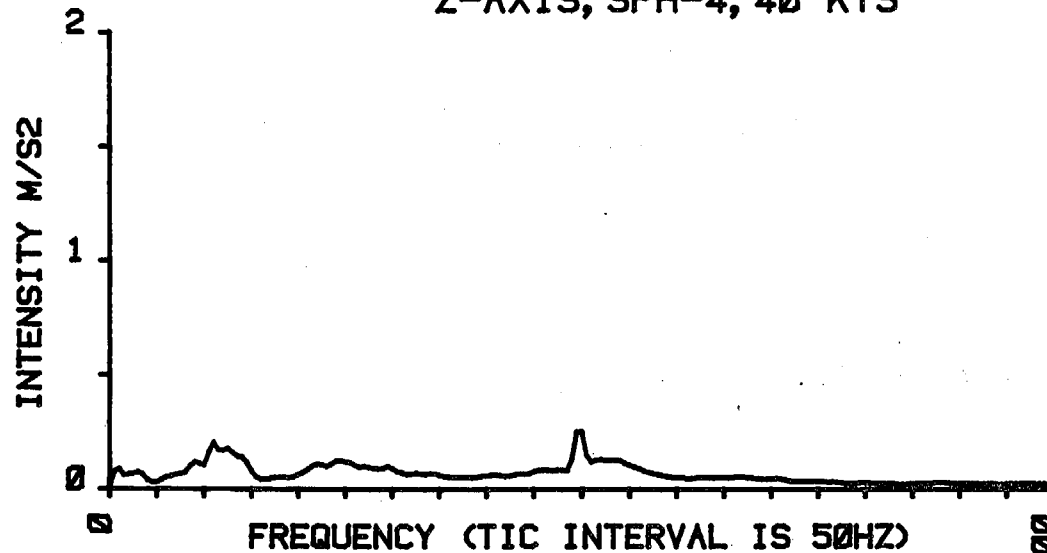
002.1606800

RMS= 0.28439 M/S²

NORMALIZED TO BETA

FIGURE C21. HELMET ACCELERATION

Z-AXIS, SPH-4, 40 KTS

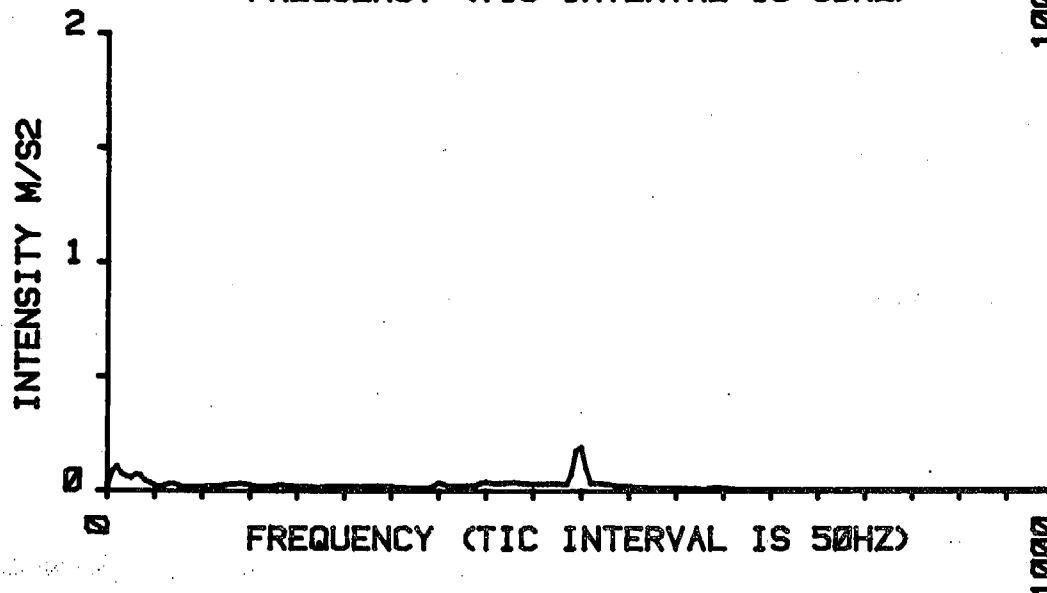


SIGHT CONNECTED

003.1606800

RMS= 0.79482 M/S2

NORMALIZED TO BETA



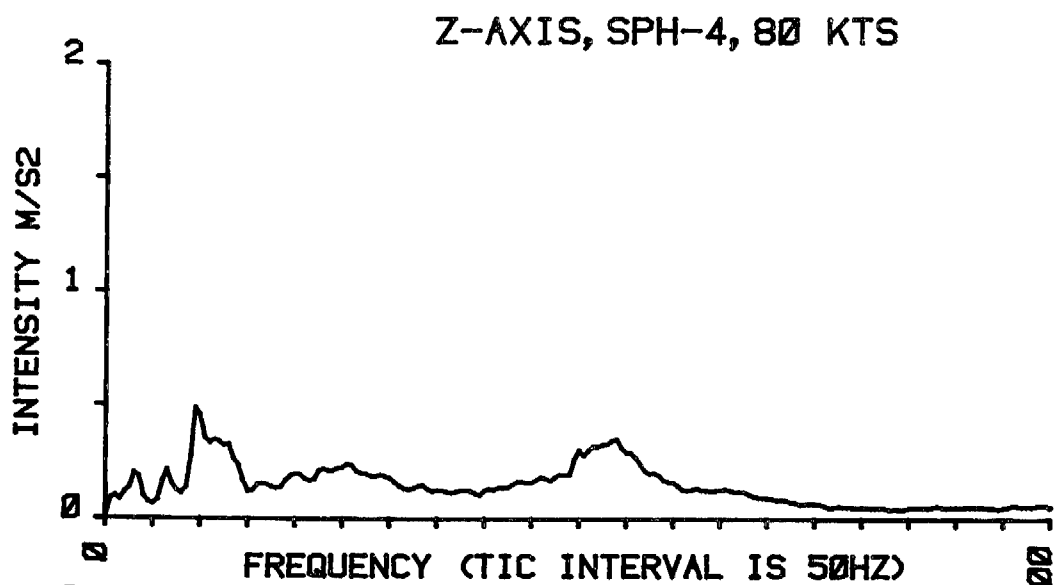
SIGHT DISCONNECTED

004.1606800

RMS= 0.31921 M/S2

NORMALIZED TO BETA

FIGURE C22. HELMET ACCELERATION

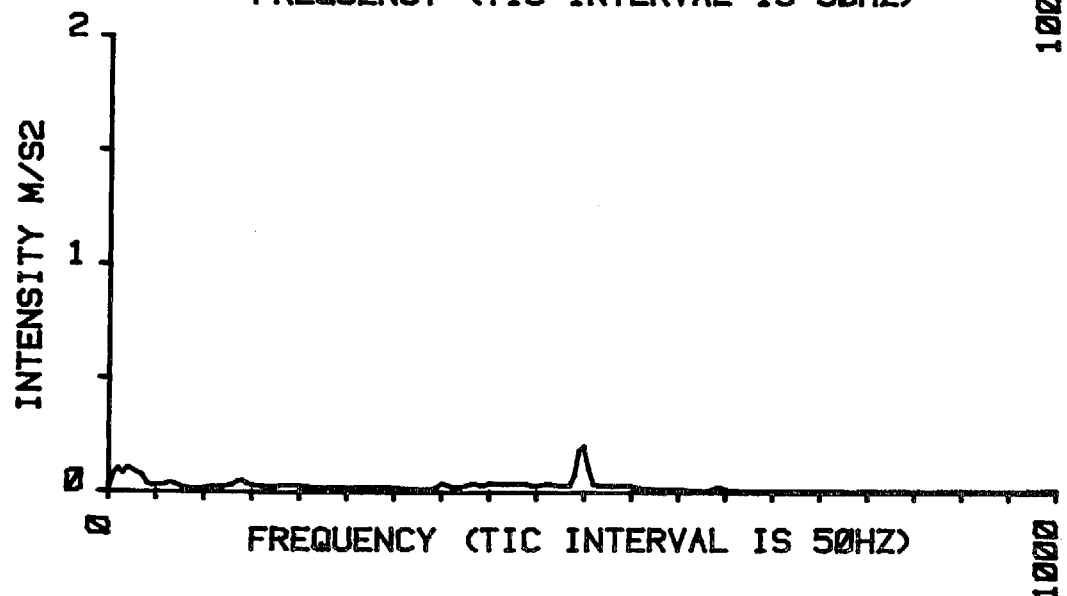


SIGHT CONNECTED

005.1606800

RMS= 1.71849 M/S²

NORMALIZED TO BETA



SIGHT DISCONNECTED

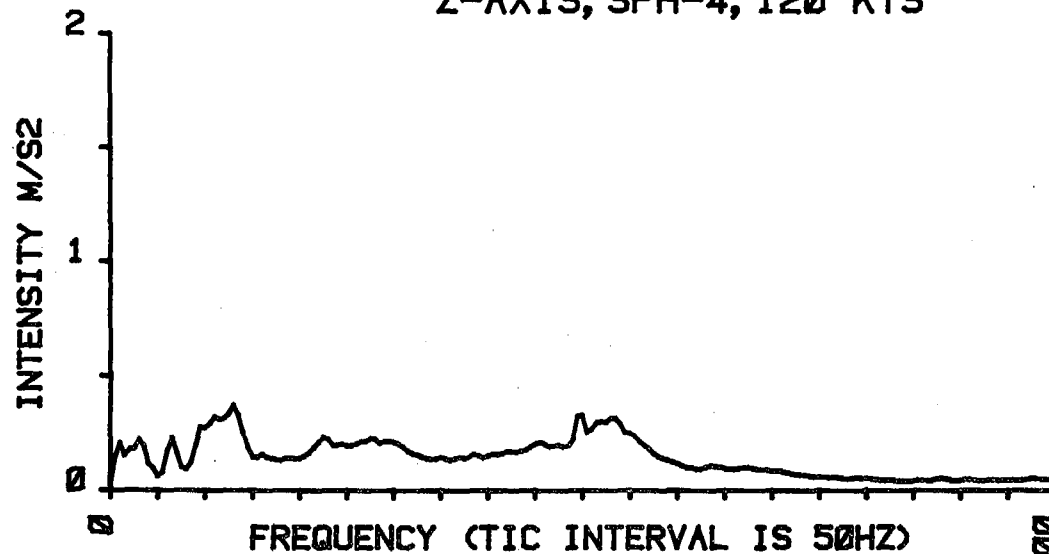
006.1606800

RMS= 0.35118 M/S²

NORMALIZED TO BETA

FIGURE C23. HELMET ACCELERATION

Z-AXIS, SPH-4, 120 KTS

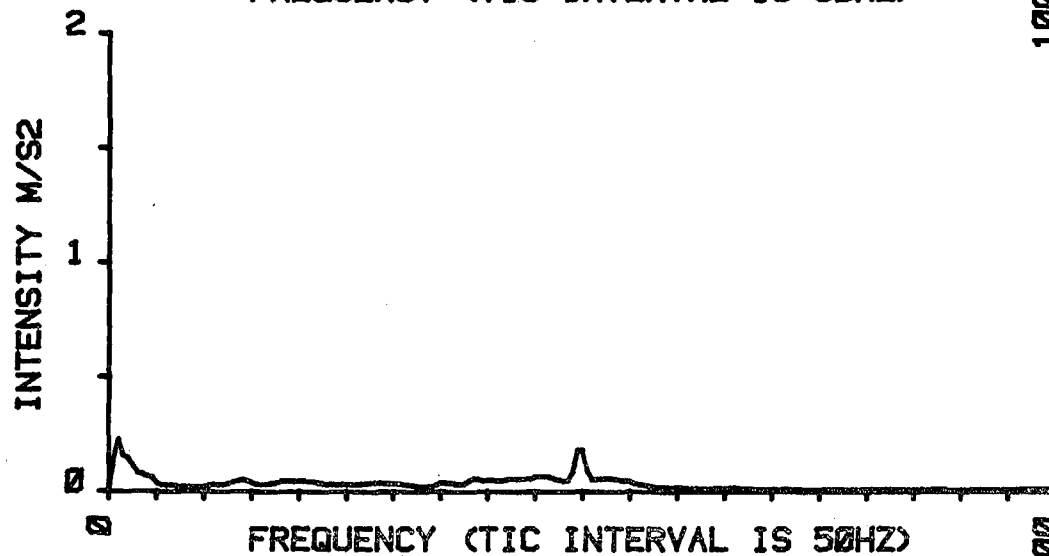


SIGHT CONNECTED

007.1606800

RMS= 1.64996 M/S²

NORMALIZED TO BETA



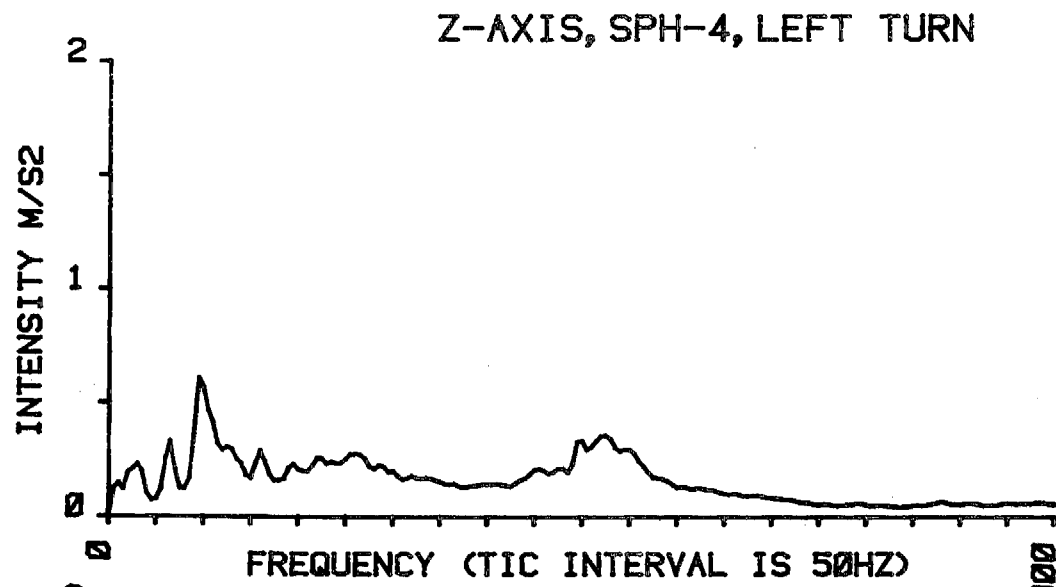
SIGHT DISCONNECTED

008.1606800

RMS= 0.46783 M/S²

NORMALIZED TO BETA

FIGURE C24. HELMET ACCELERATION

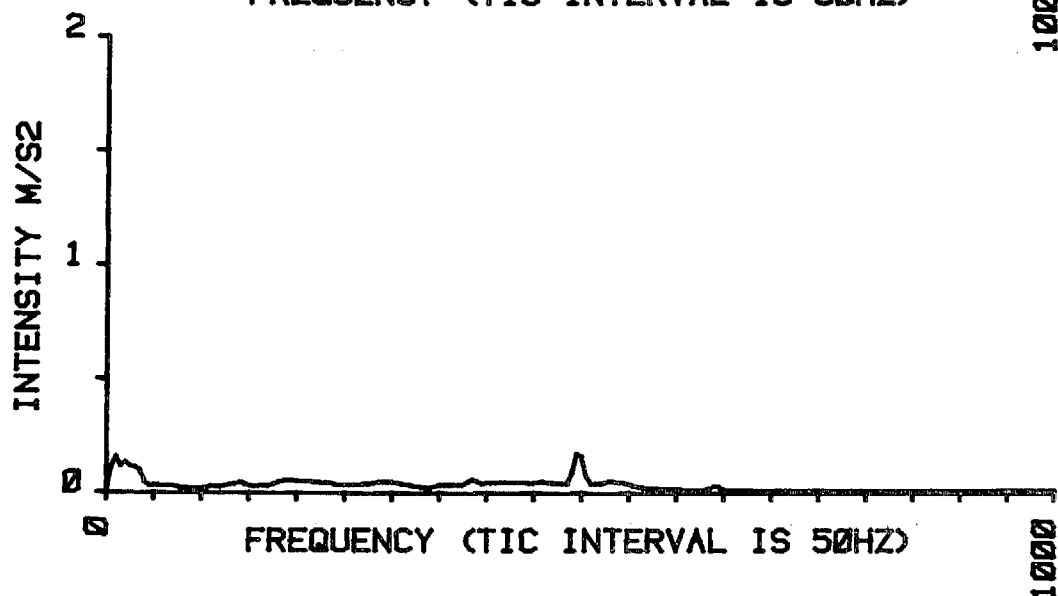


SIGHT CONNECTED

009.1606800

RMS= 1.90948 M/S2

NORMALIZED TO BETA



SIGHT DISCONNECTED

010.1606800

RMS= 0.42373 M/S2

NORMALIZED TO BETA

FIGURE C25. HELMET ACCELERATION

SIGHT CONNECTED

002.1706800

RMS= 0.56322 M/S2

NORMALIZED TO BETA

SIGHT DISCONNECTED

003.1706800

RMS= 0.37996 M/S2

NORMALIZED TO BETA

Z-AXIS, FORM FIT, HOVER

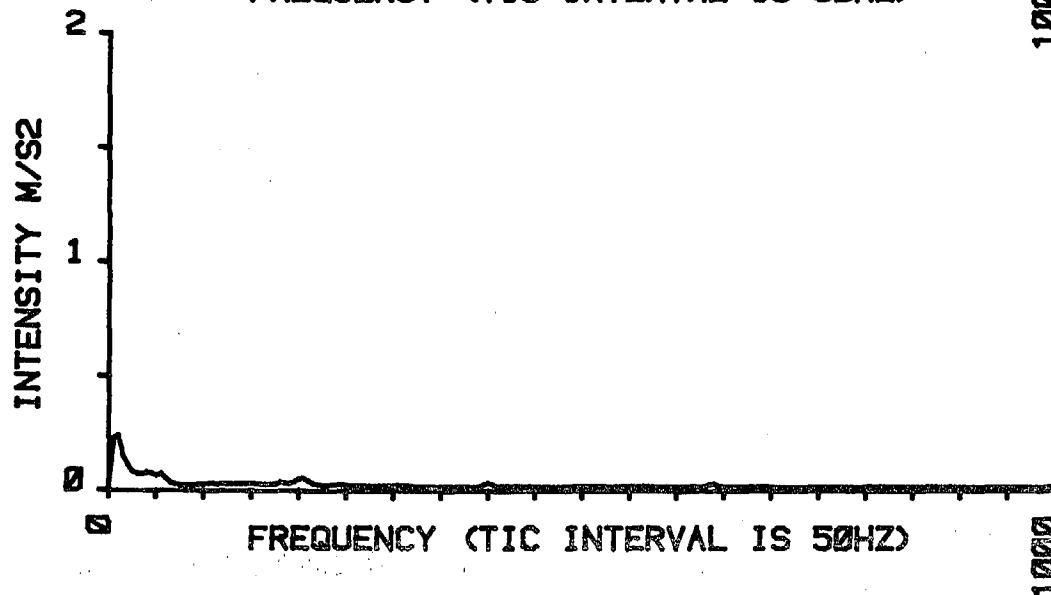
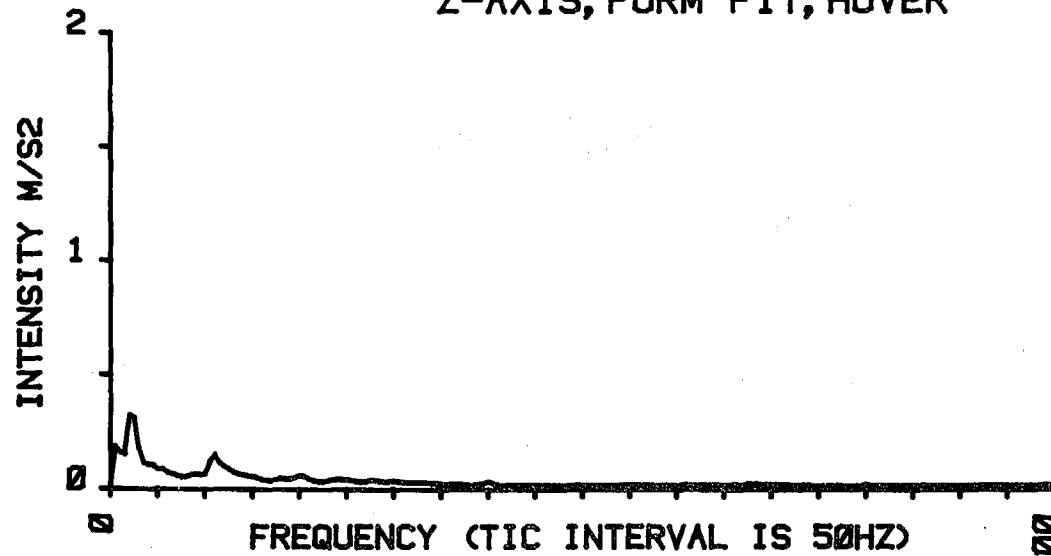
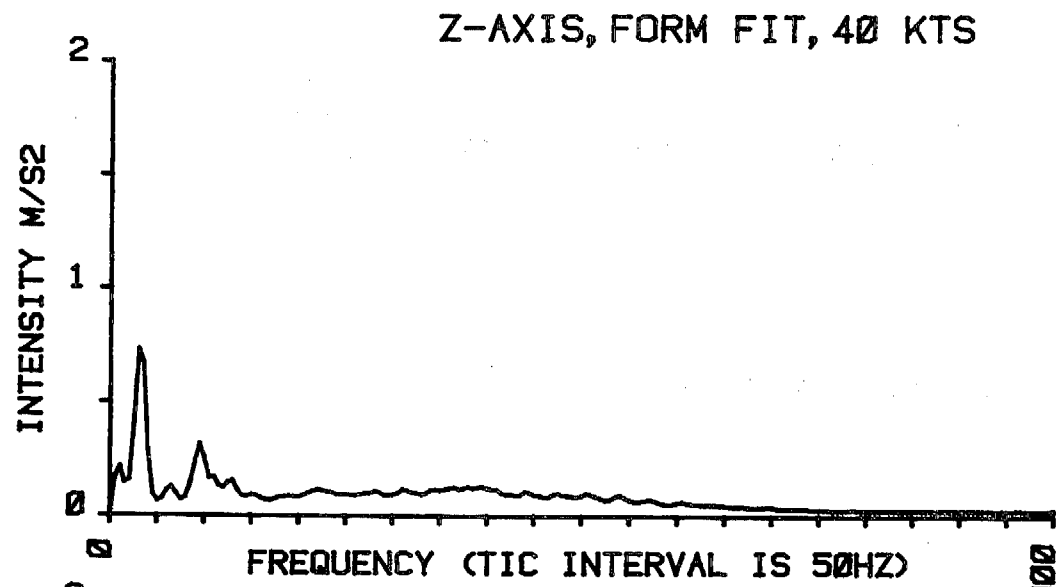


FIGURE C26. HELMET ACCELERATION

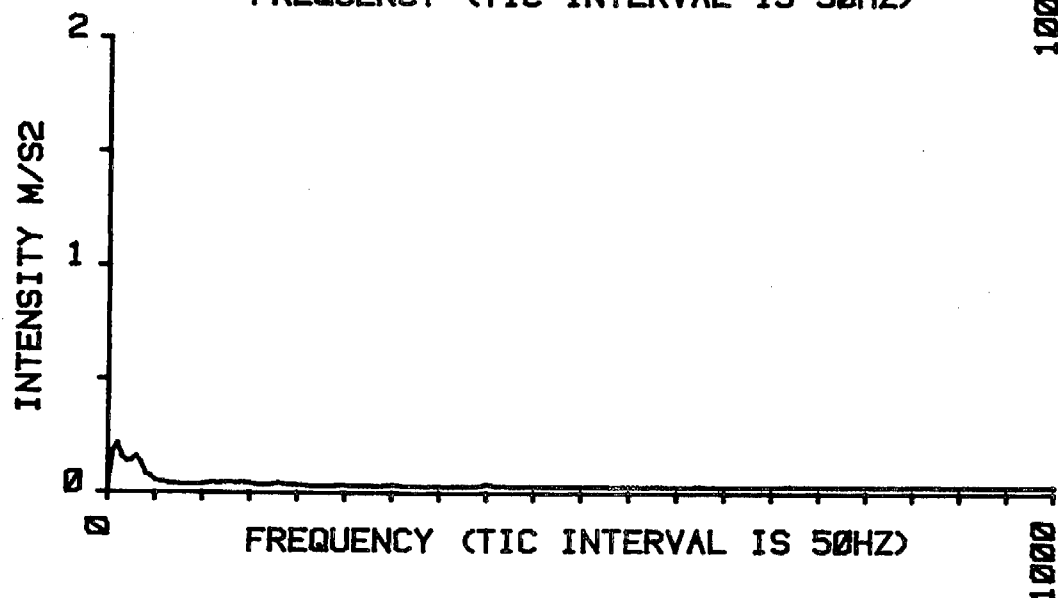


SIGHT CONNECTED

004.1706800

RMS= 1.19556 M/S2

NORMALIZED TO BETA



SIGHT DISCONNECTED

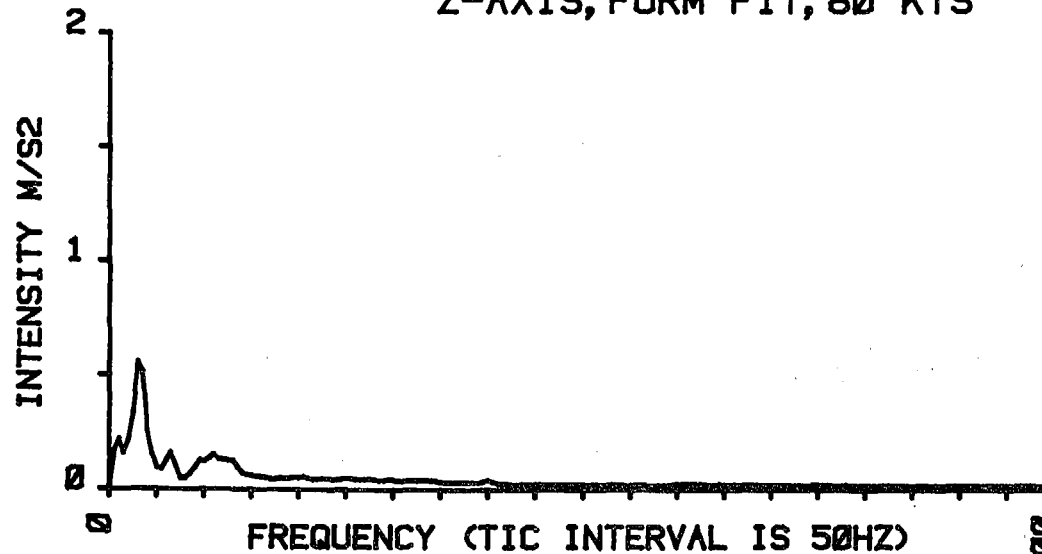
005.1706800

RMS= 0.44937 M/S2

NORMALIZED TO BETA

FIGURE C27. HELMET ACCELERATION

Z-AXIS, FORM FIT, 80 KTS

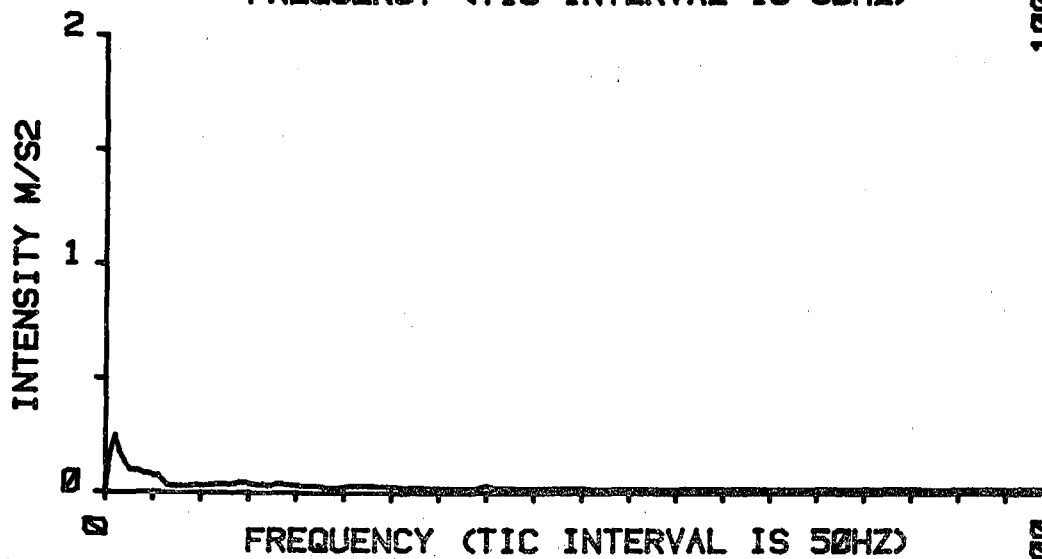


SIGHT CONNECTED

008.1706800

RMS= 0.82938 M/S2

NORMALIZED TO BETA



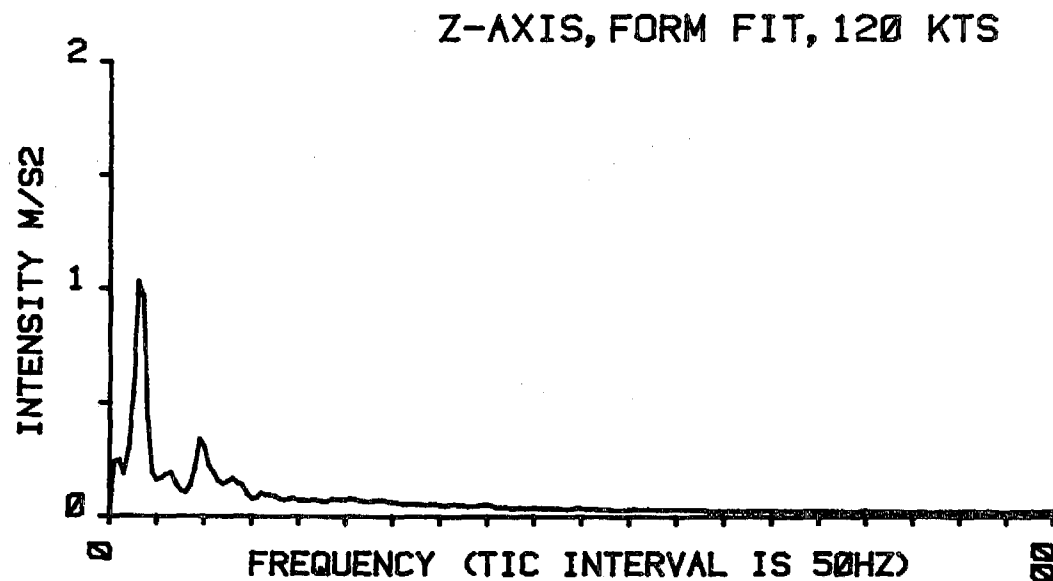
SIGHT DISCONNECTED

009.1706800

RMS= 0.38890 M/S2

NORMALIZED TO BETA

FIGURE C28. HELMET ACCELERATION

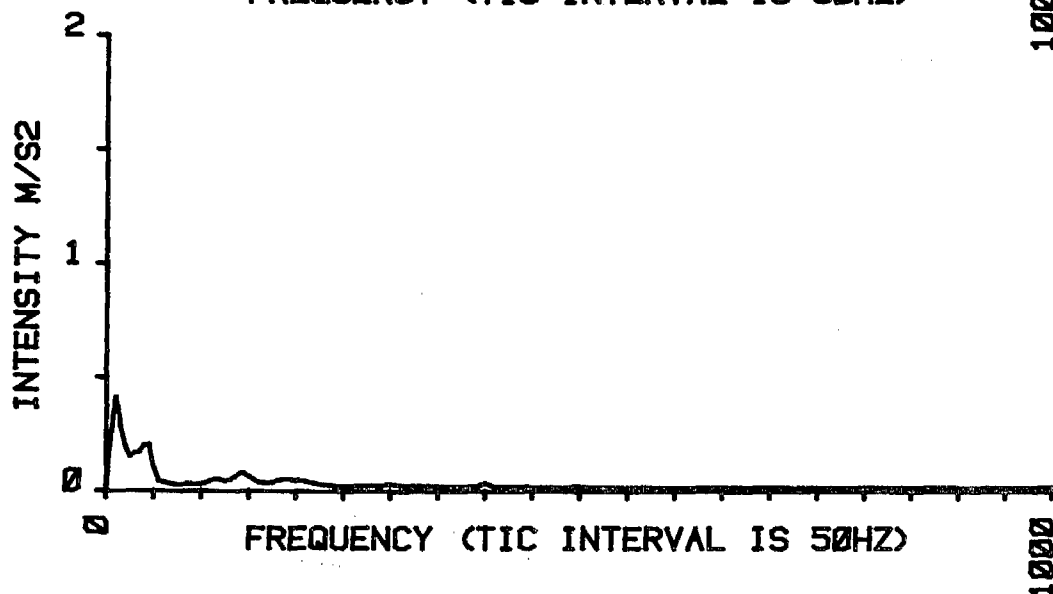


SIGHT CONNECTED

010.1706800

RMS= 1.39338 M/S²

NORMALIZED TO BETA



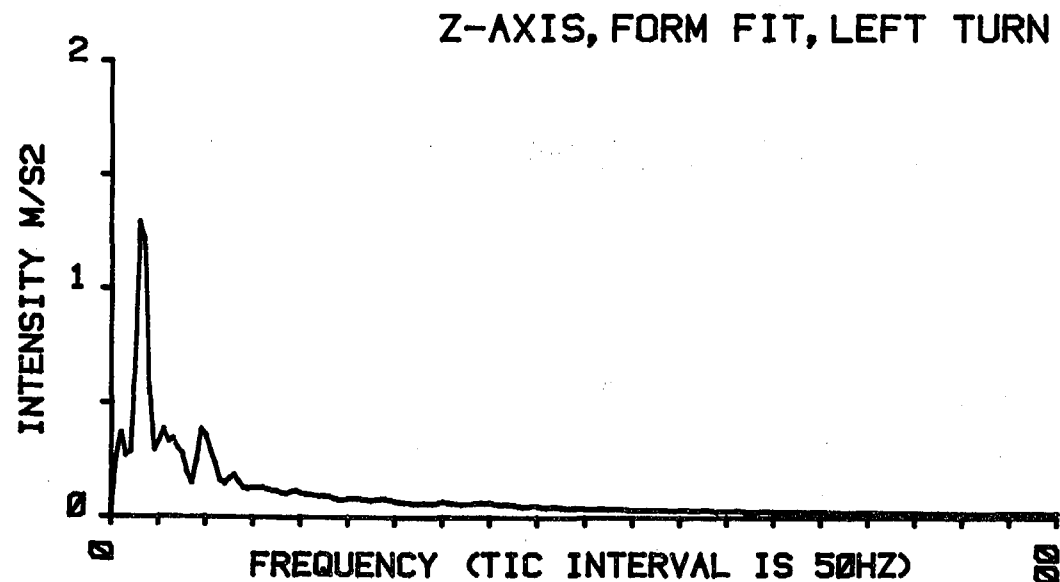
SIGHT DISCONNECTED

011.1706800

RMS= 0.58295 M/S²

NORMALIZED TO BETA

FIGURE C29. HELMET ACCELERATION

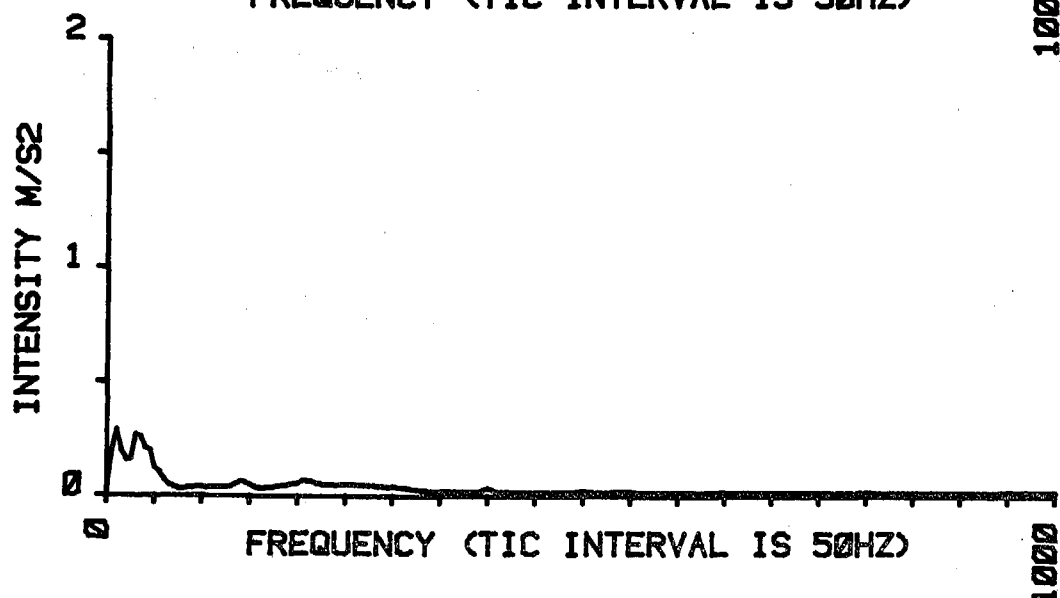


SIGHT CONNECTED

012.1706800

RMS= 1.78555 M/S2

NORMALIZED TO BETA



SIGHT DISCONNECTED

013.1706800

RMS= 0.56643 M/S2

NORMALIZED TO BETA

FIGURE C30. HELMET ACCELERATION

APPENDIX D
DIFFERENCE IN HELMET ACCELERATION SPECTRA

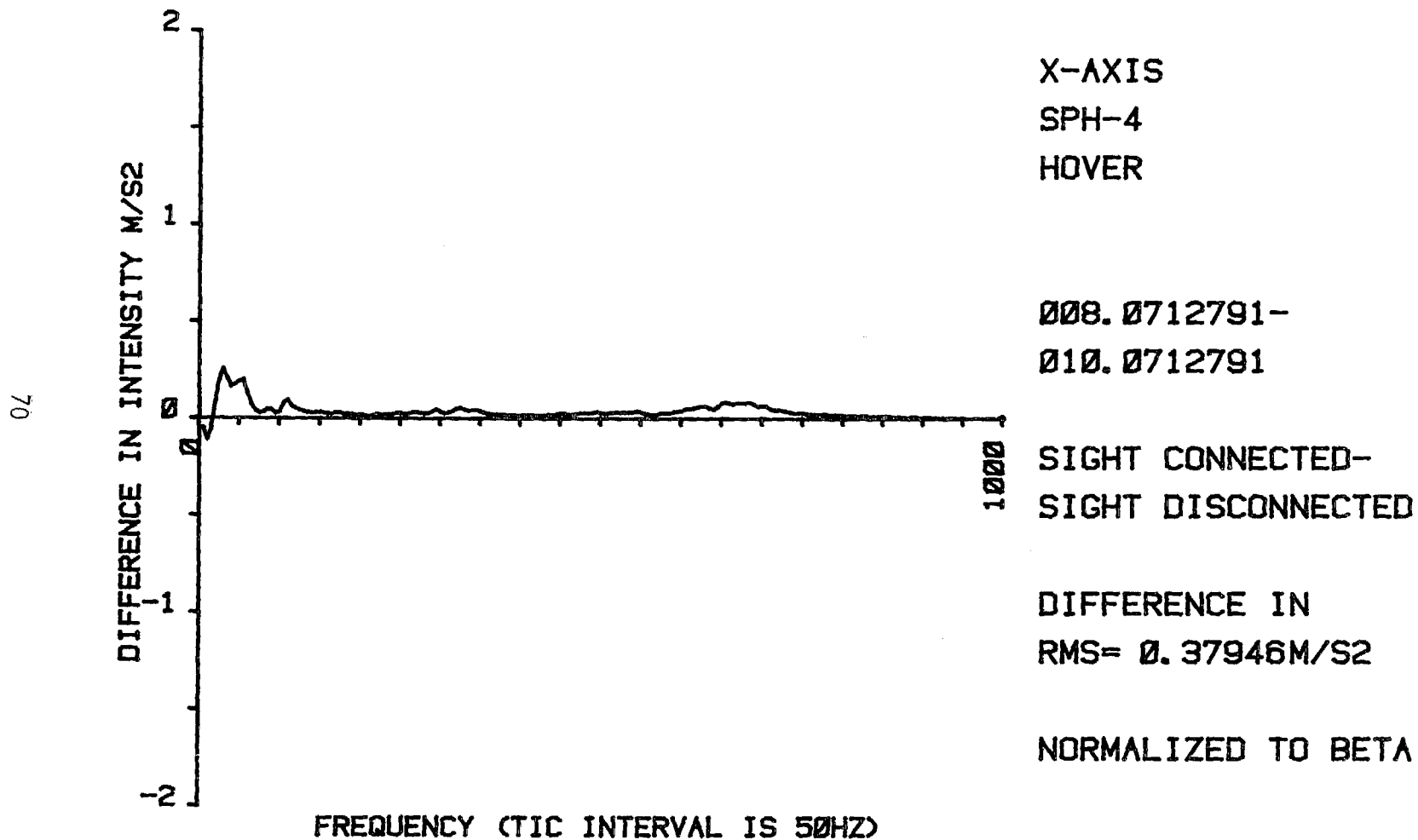


FIGURE D1. DIFFERENCE IN HELMET ACCELERATION

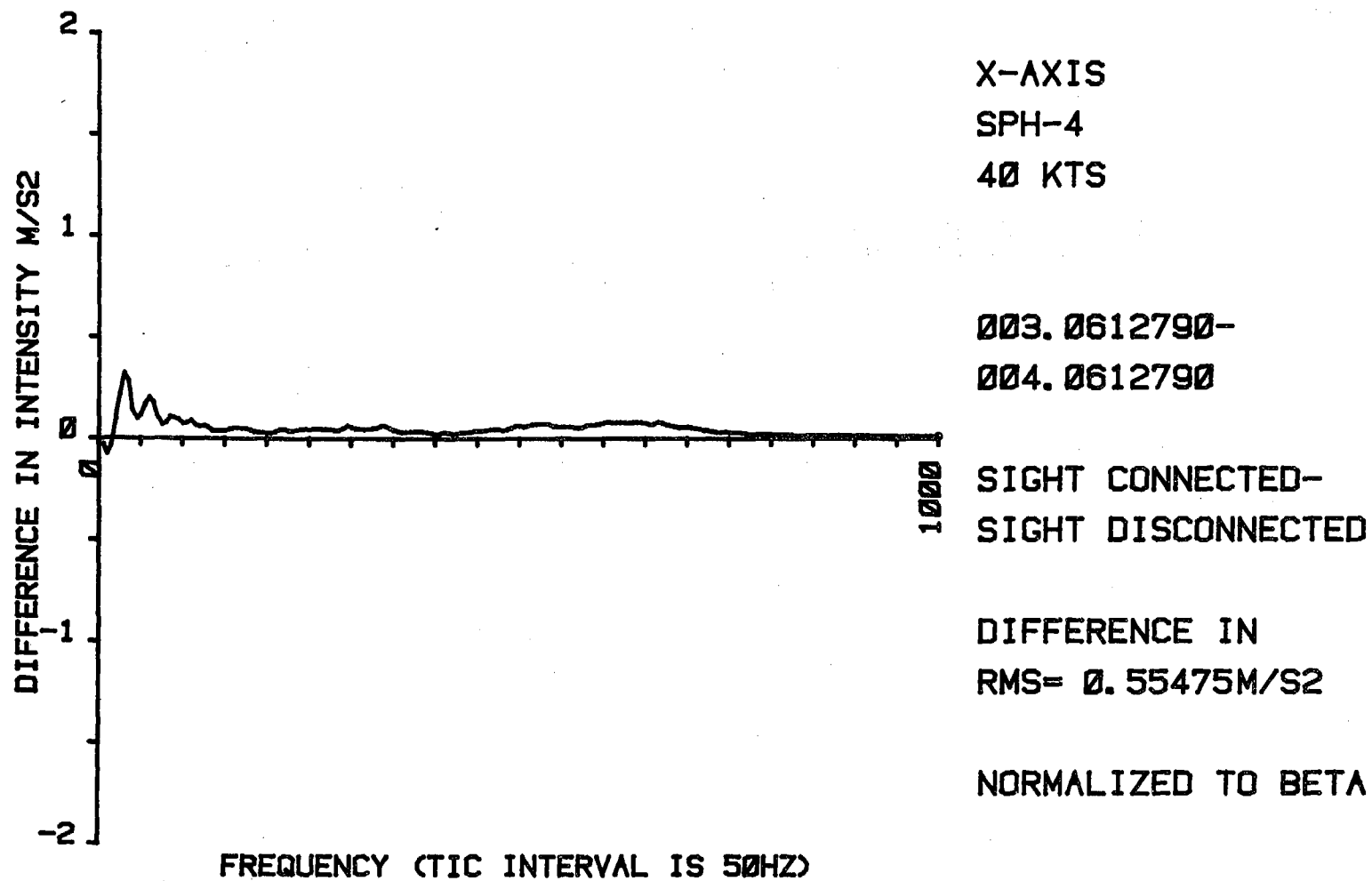


FIGURE D2. DIFFERENCE IN HELMET ACCELERATION

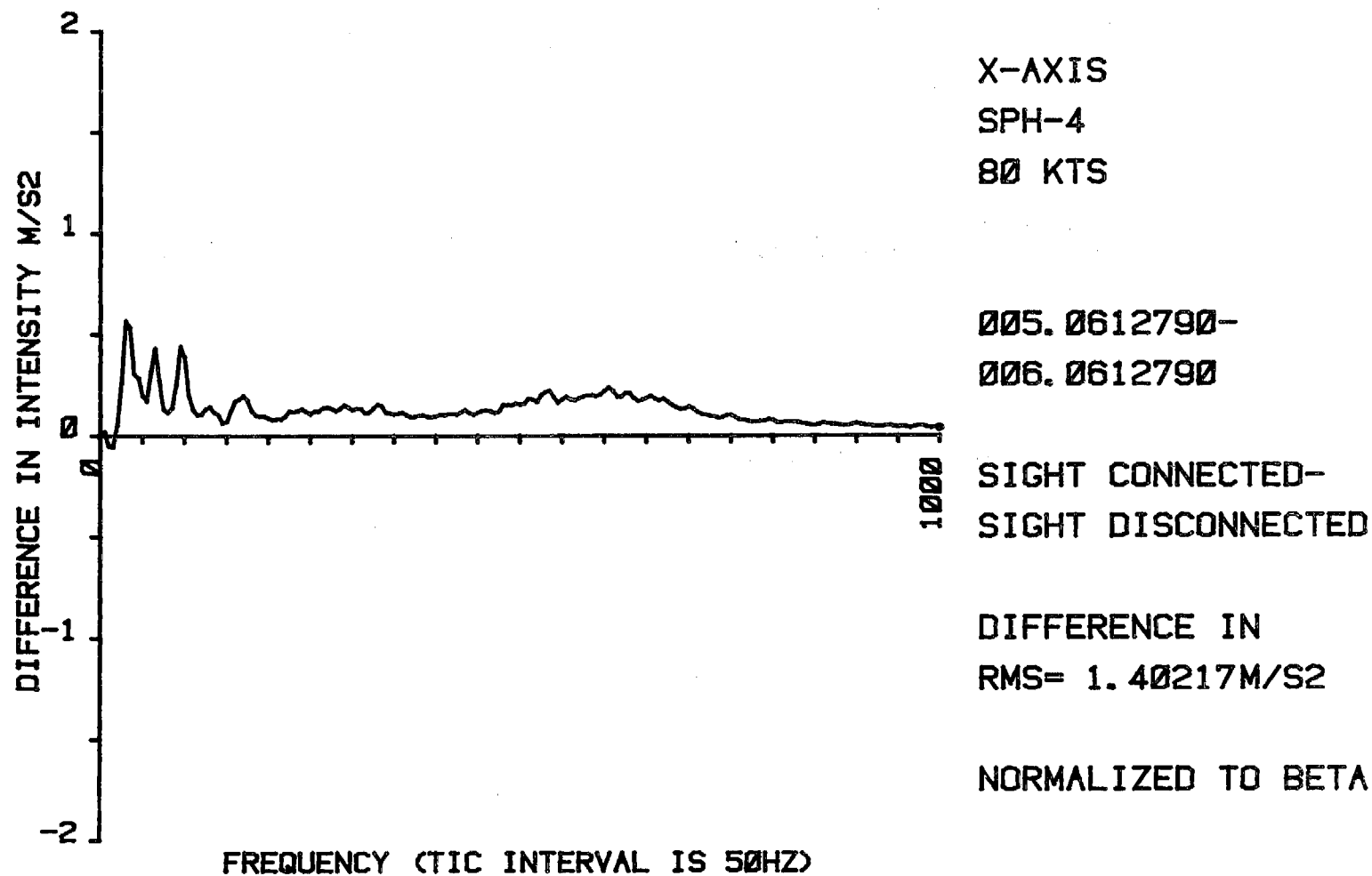


FIGURE D3. DIFFERENCE IN HELMET ACCELERATION

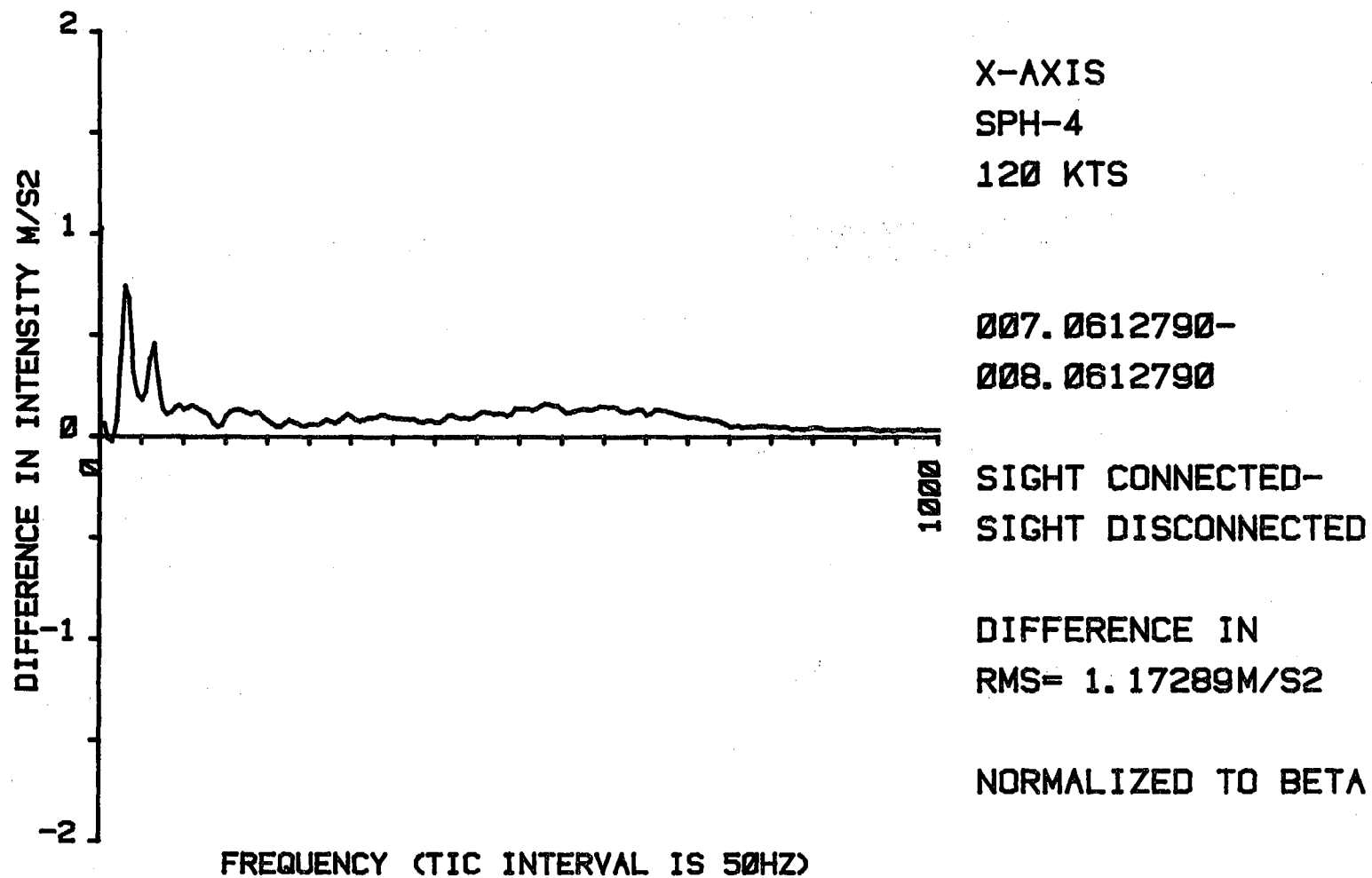
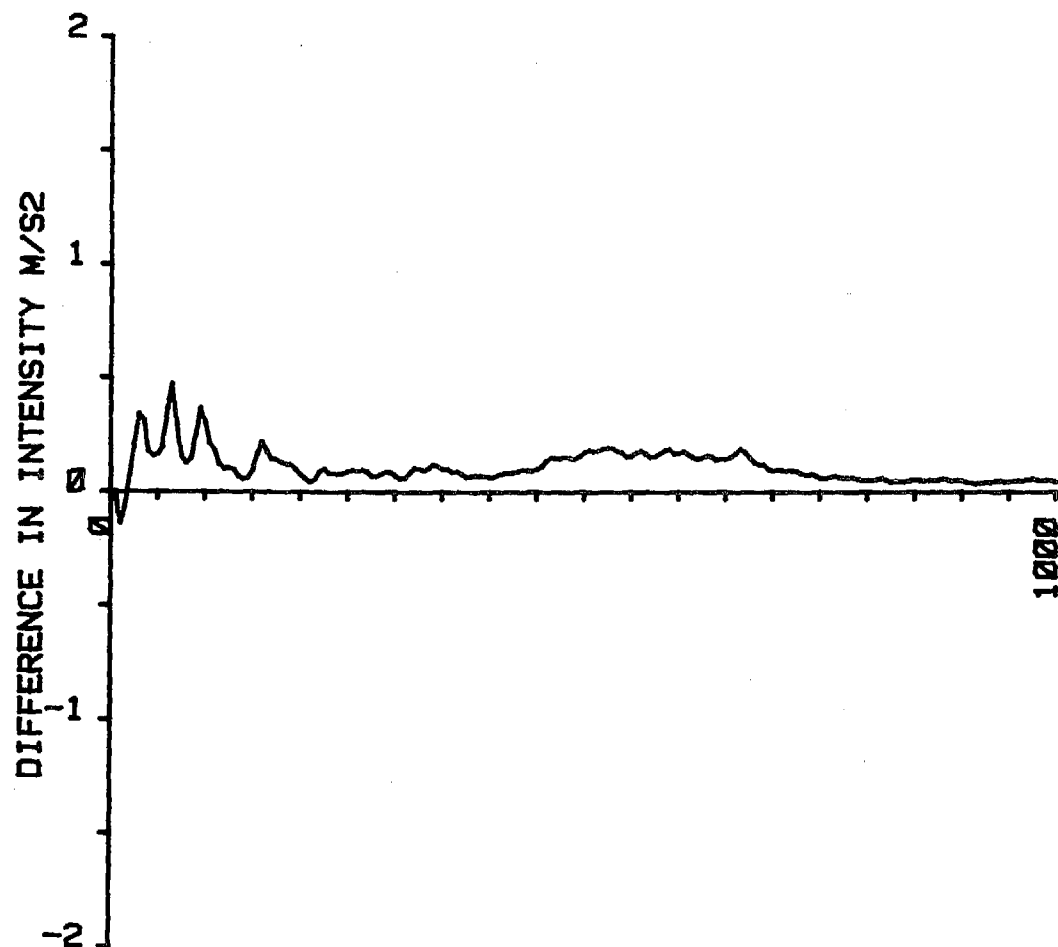


FIGURE D4. DIFFERENCE IN HELMET ACCELERATION



X-AXIS
SPH-4
LEFT TURN

009.0612790-
010.0612790

SIGHT CONNECTED-
SIGHT DISCONNECTED

DIFFERENCE IN
RMS= 1.14137M/S2

NORMALIZED TO BETA

FREQUENCY (TIC INTERVAL IS 50HZ)

FIGURE D5. DIFFERENCE IN HELMET ACCELERATION

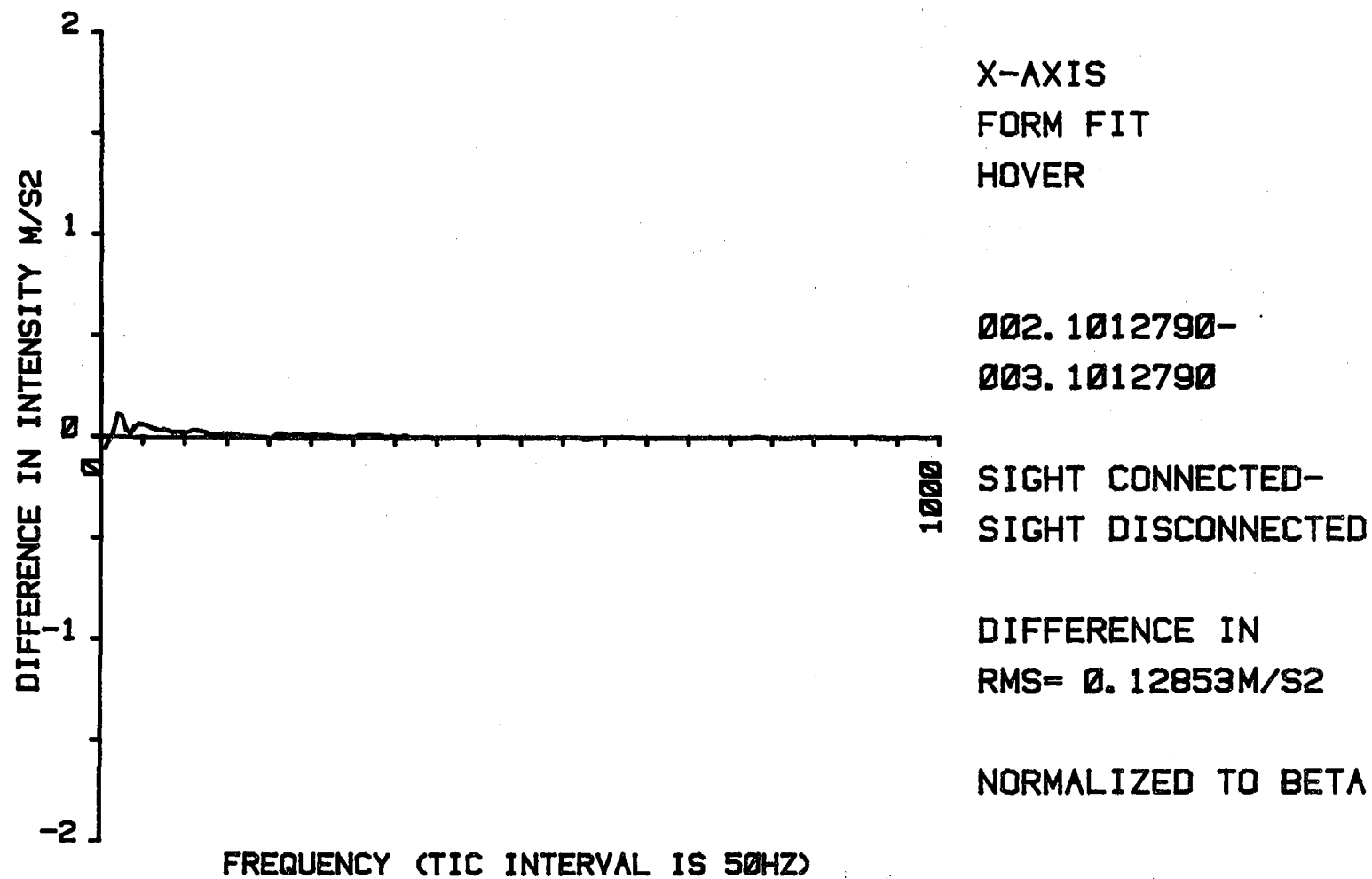


FIGURE D6. DIFFERENCE IN HELMET ACCELERATION

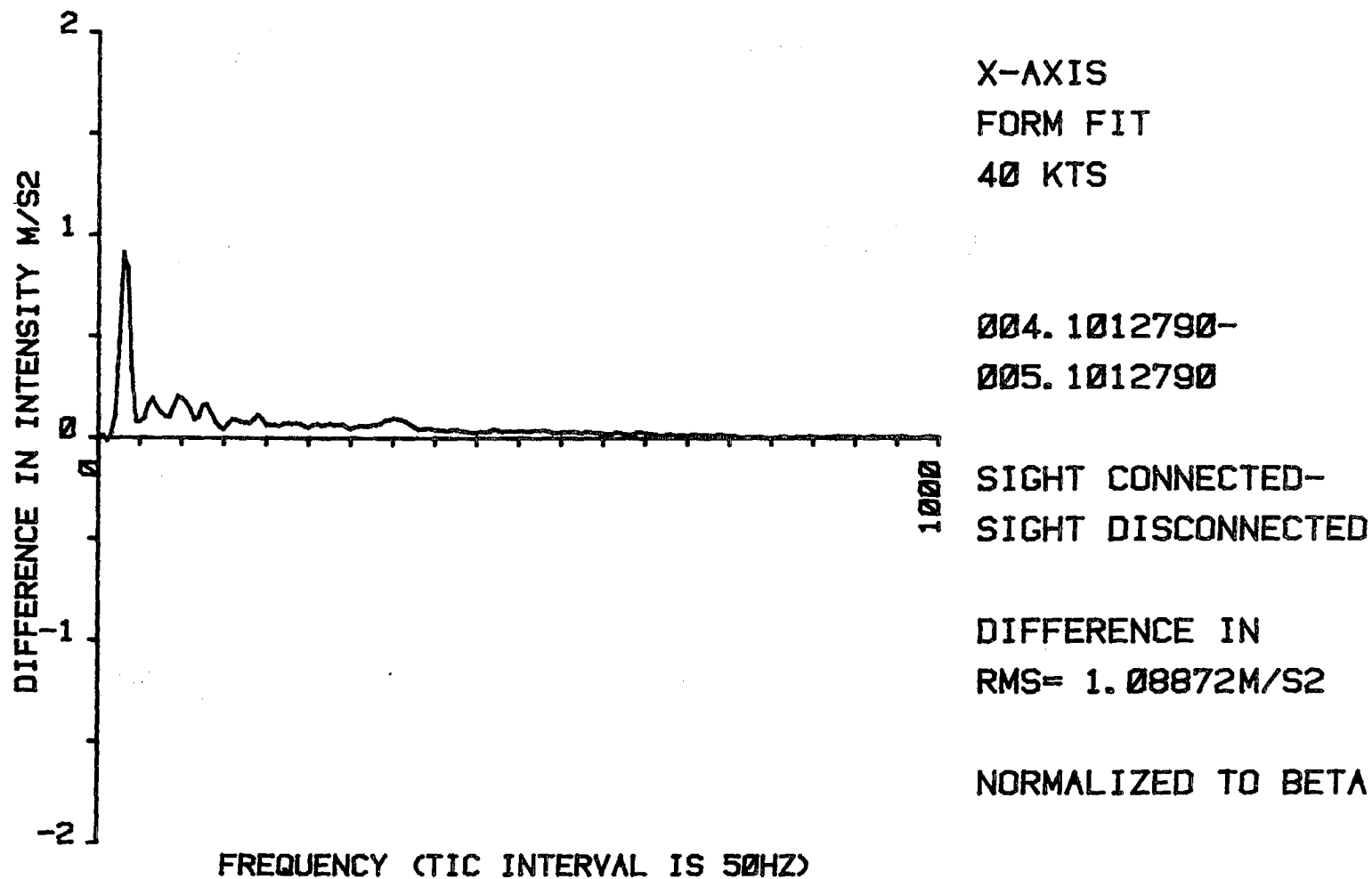


FIGURE D7. DIFFERENCE IN HELMET ACCELERATION

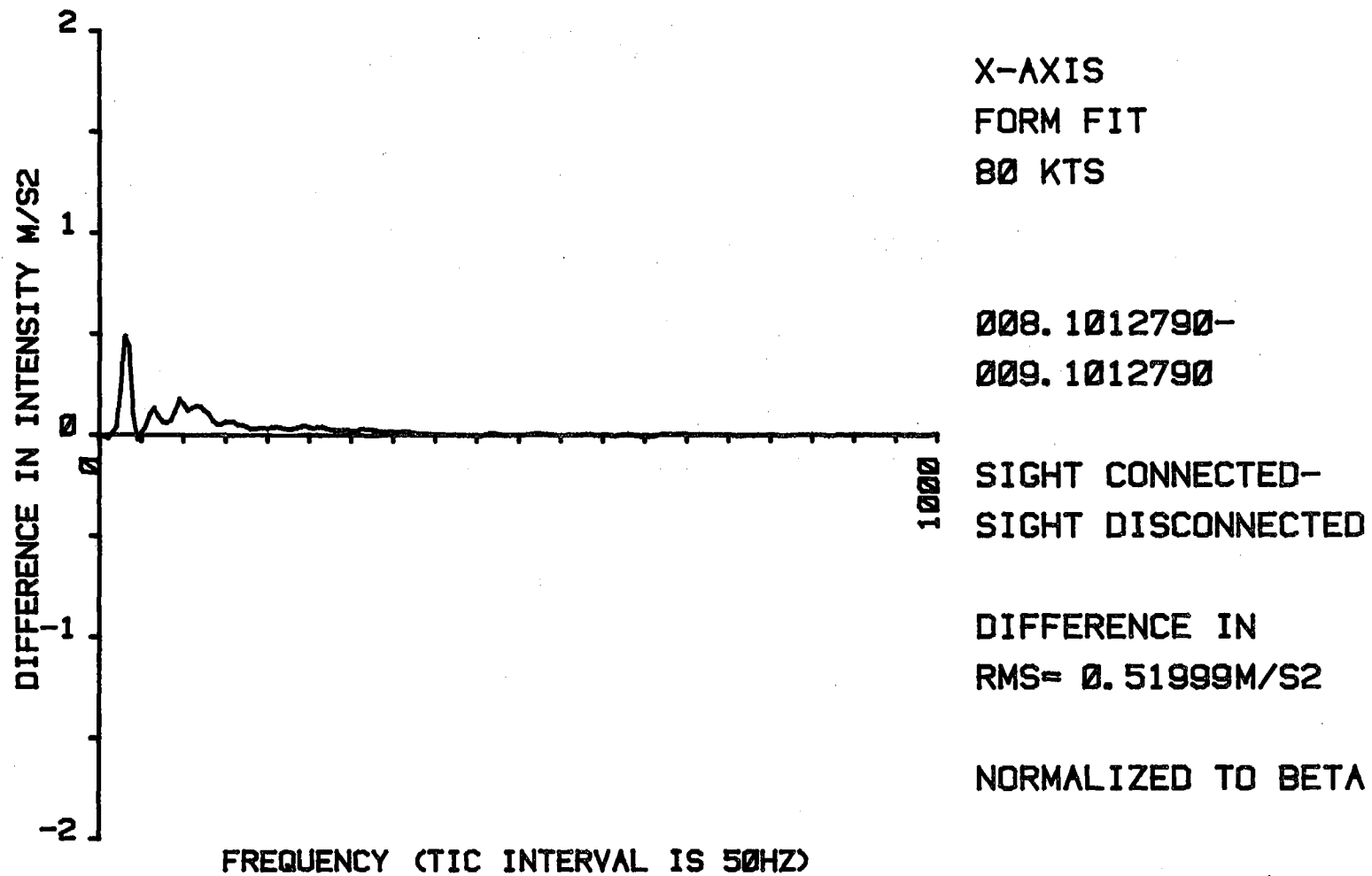
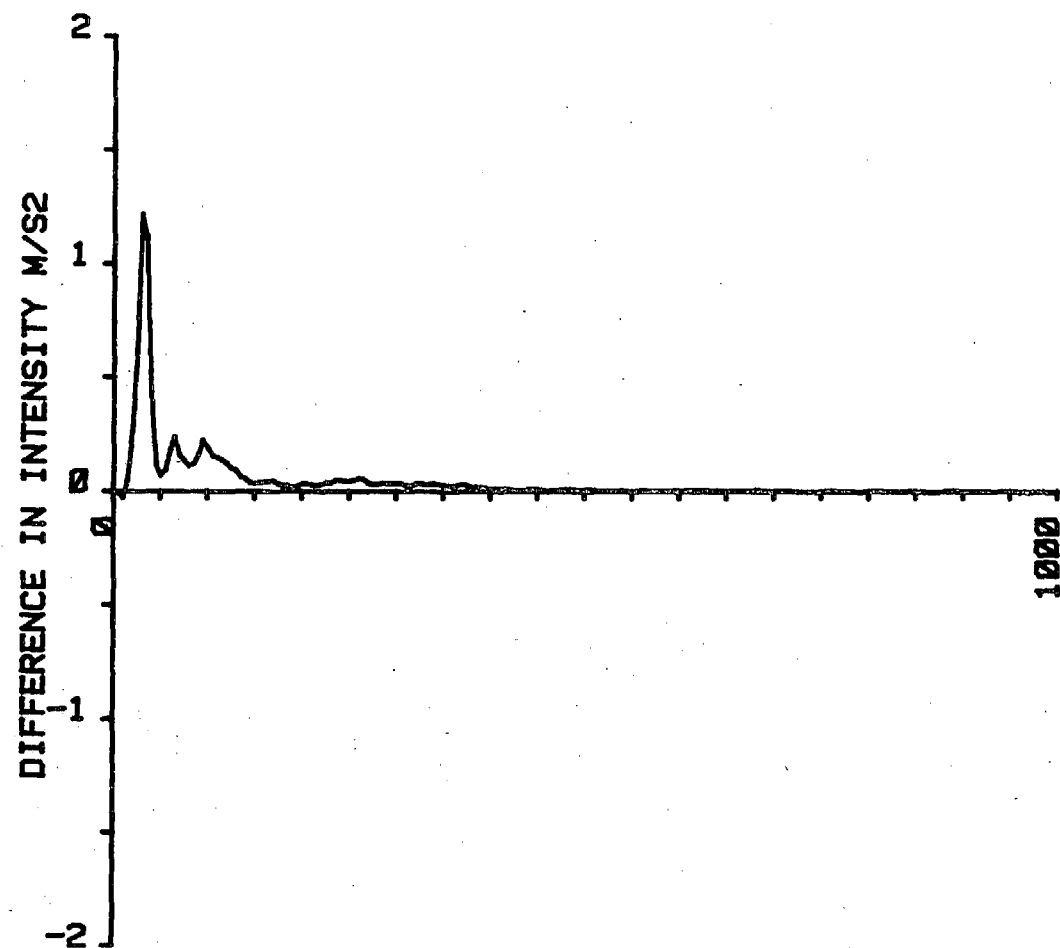


FIGURE D8. DIFFERENCE IN HELMET ACCELERATION



X-AXIS
FORM FIT
120 KTS

010.1012790-
011.1012790

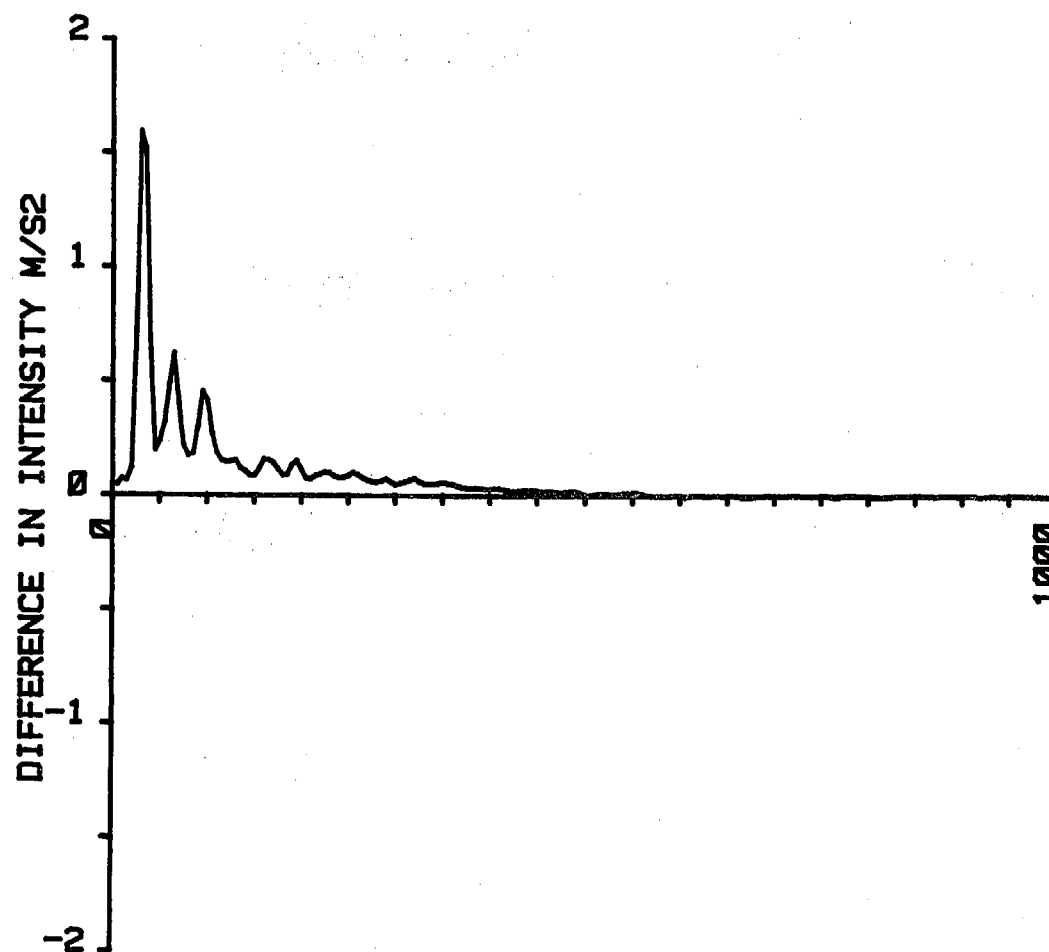
SIGHT CONNECTED-
SIGHT DISCONNECTED

DIFFERENCE IN
RMS= 1.27357M/S2

NORMALIZED TO BETA

FREQUENCY (TIC INTERVAL IS 50HZ)

FIGURE D9. DIFFERENCE IN HELMET ACCELERATION



X-AXIS
FORM FIT
LEFT TURN

012. 1012790-
013. 1012790

SIGHT CONNECTED-
SIGHT DISCONNECTED

DIFFERENCE IN
RMS= 1.91401M/S²

NORMALIZED TO BETA

FREQUENCY (TIC INTERVAL IS 50HZ)

FIGURE D10. DIFFERENCE IN HELMET ACCELERATION

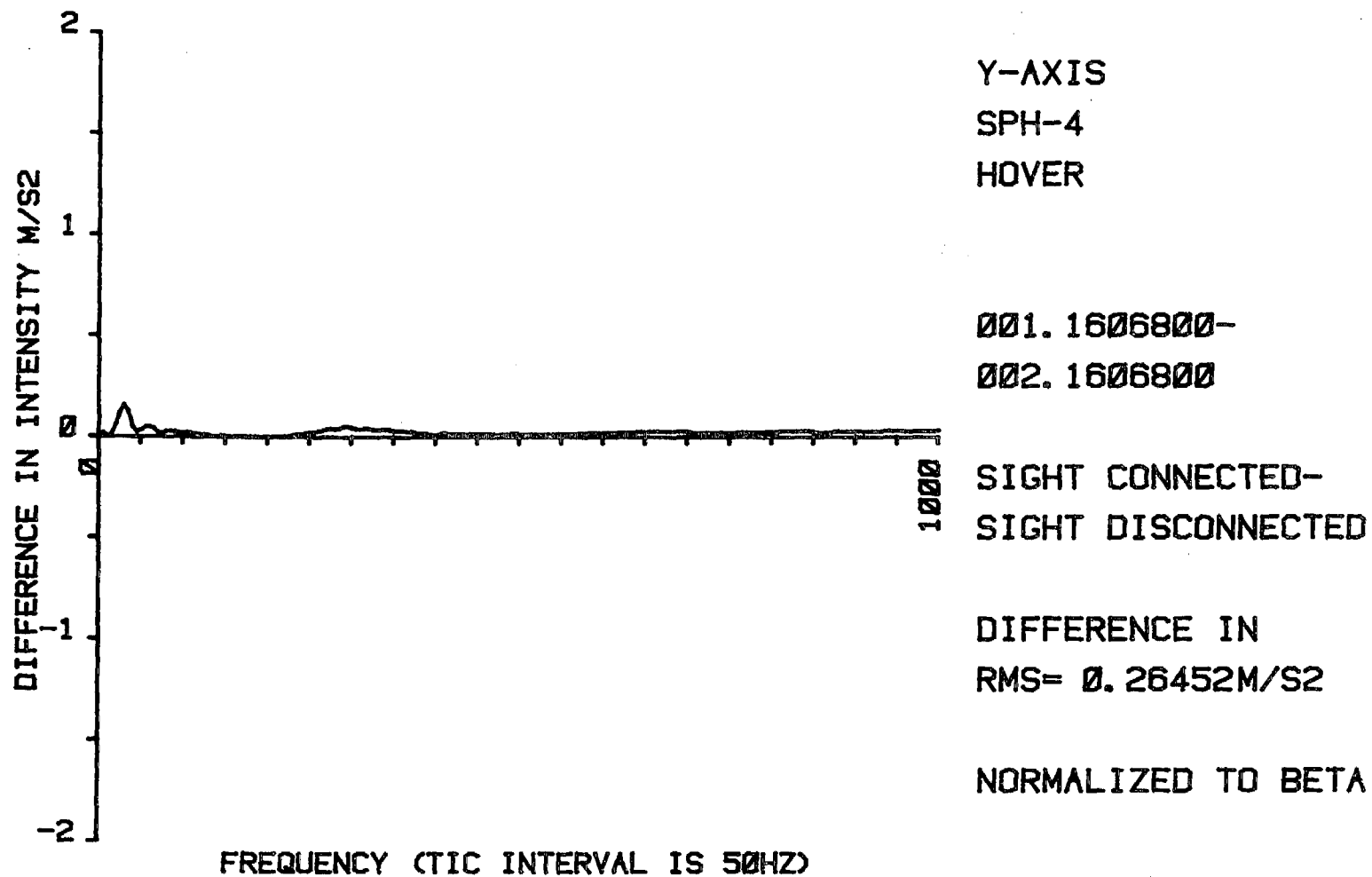


FIGURE D11. DIFFERENCE IN HELMET ACCELERATION

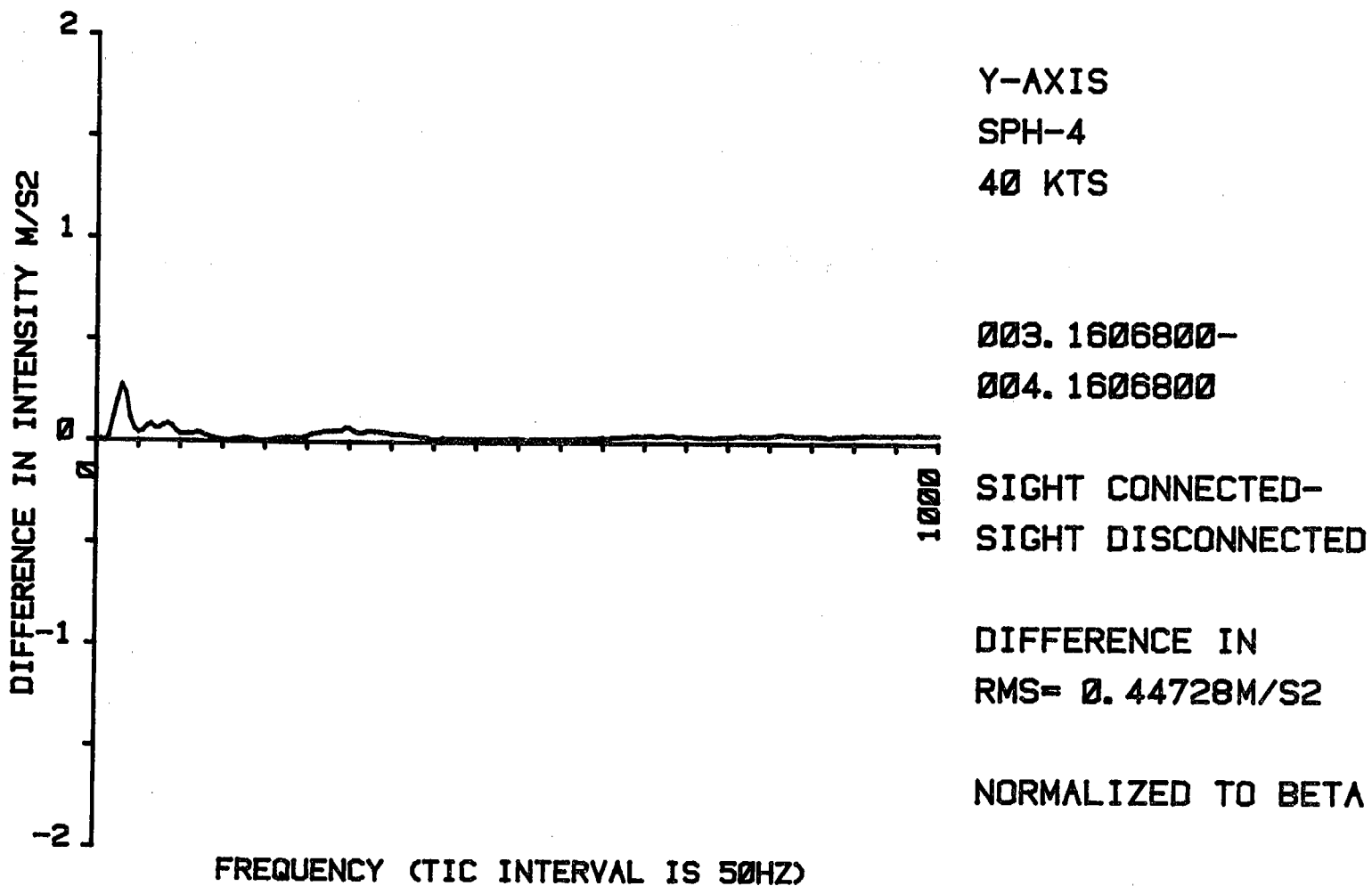


FIGURE D12. DIFFERENCE IN HELMET ACCELERATION

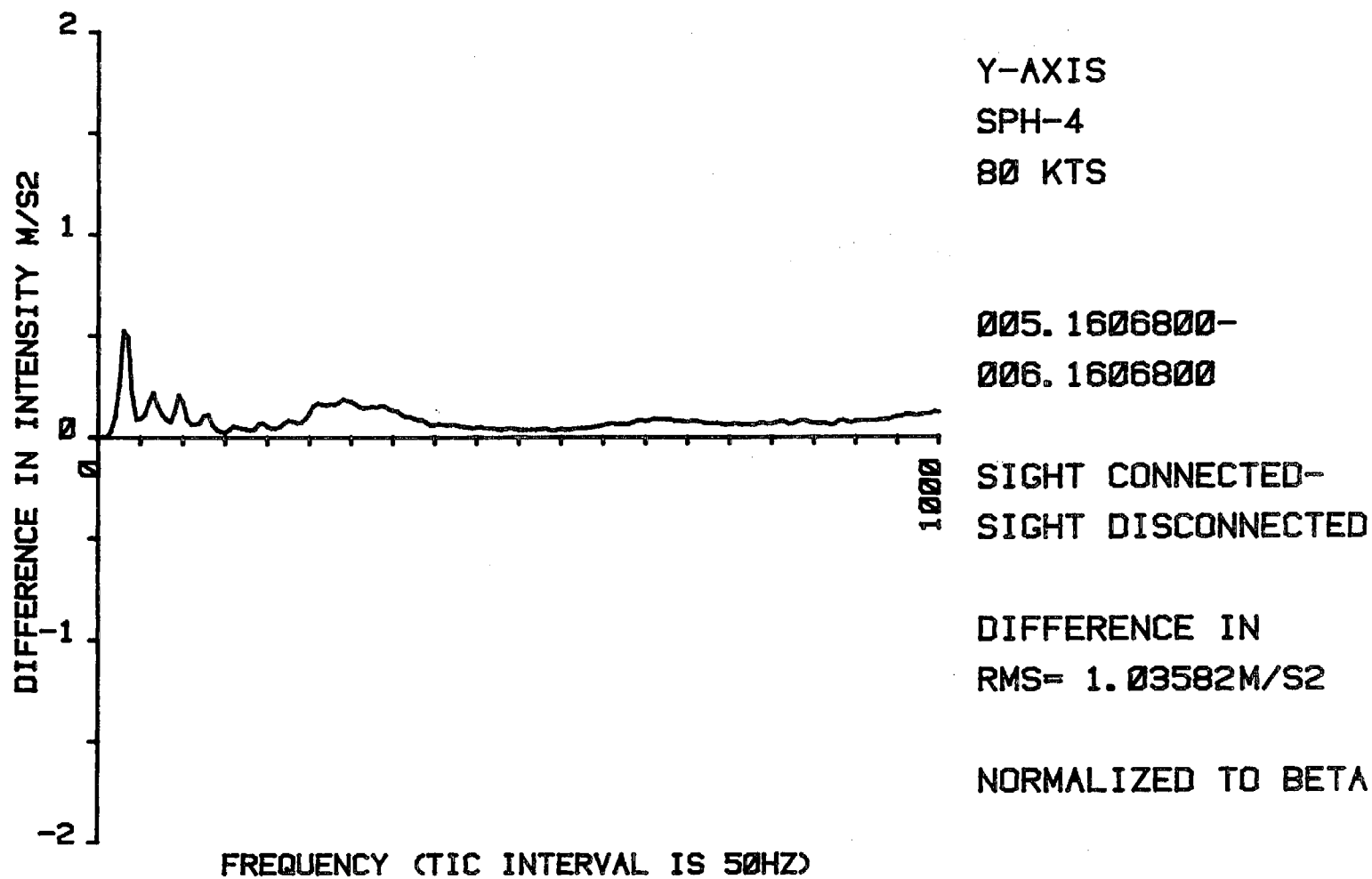


FIGURE D13. DIFFERENCE IN HELMET ACCELERATION

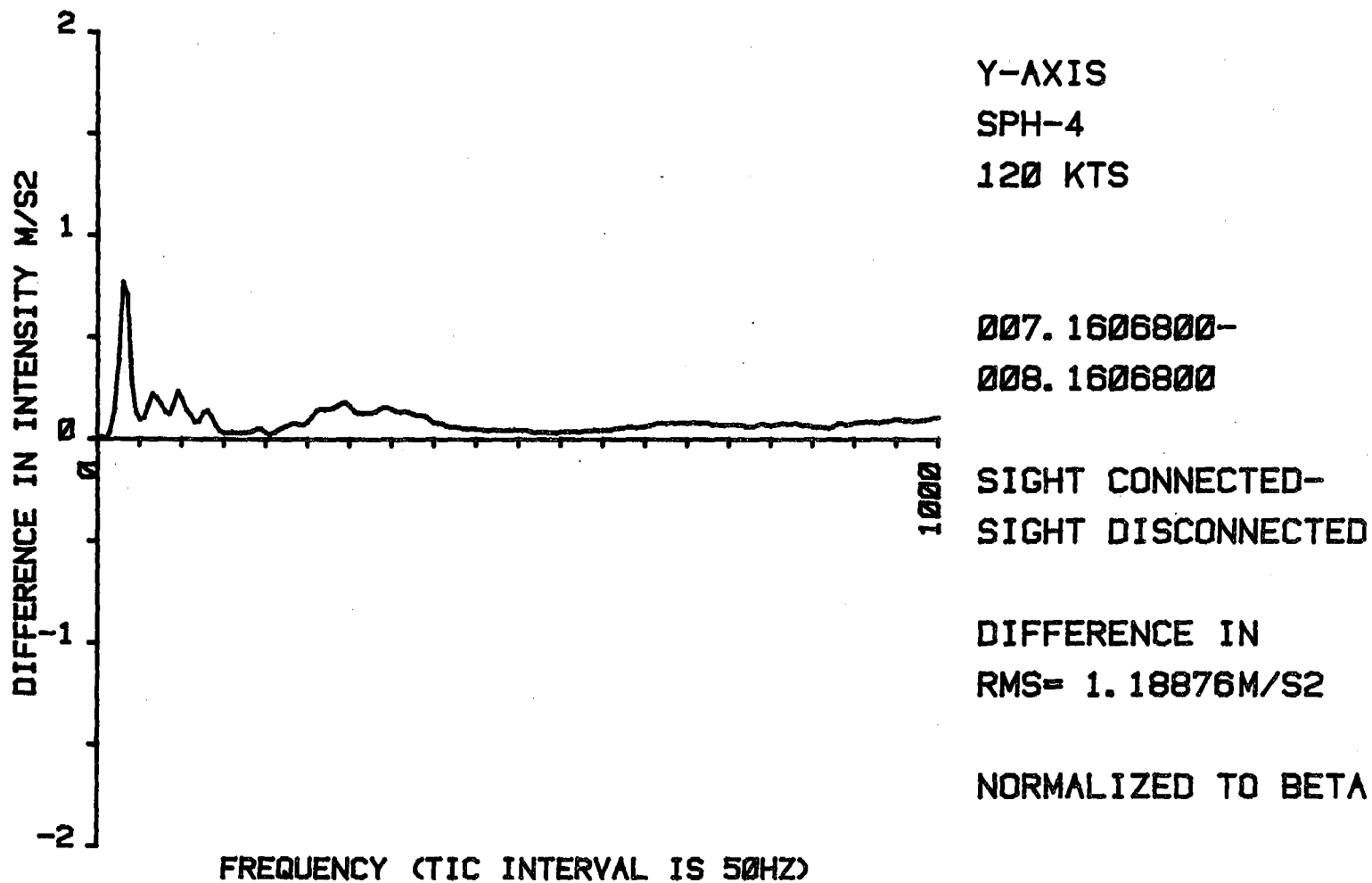


FIGURE D14. DIFFERENCE IN HELMET ACCELERATION

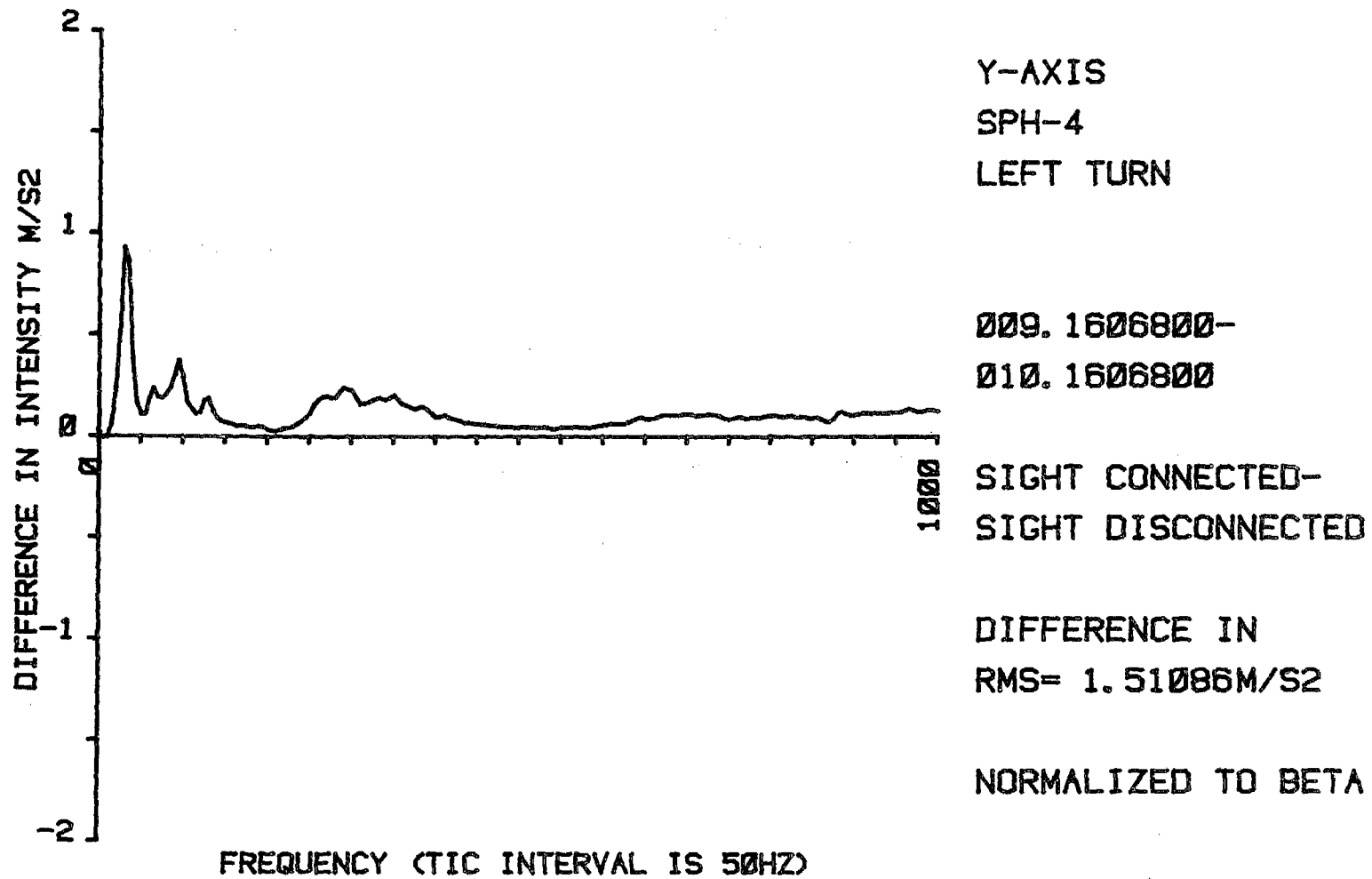


FIGURE D15. DIFFERENCE IN HELMET ACCELERATION

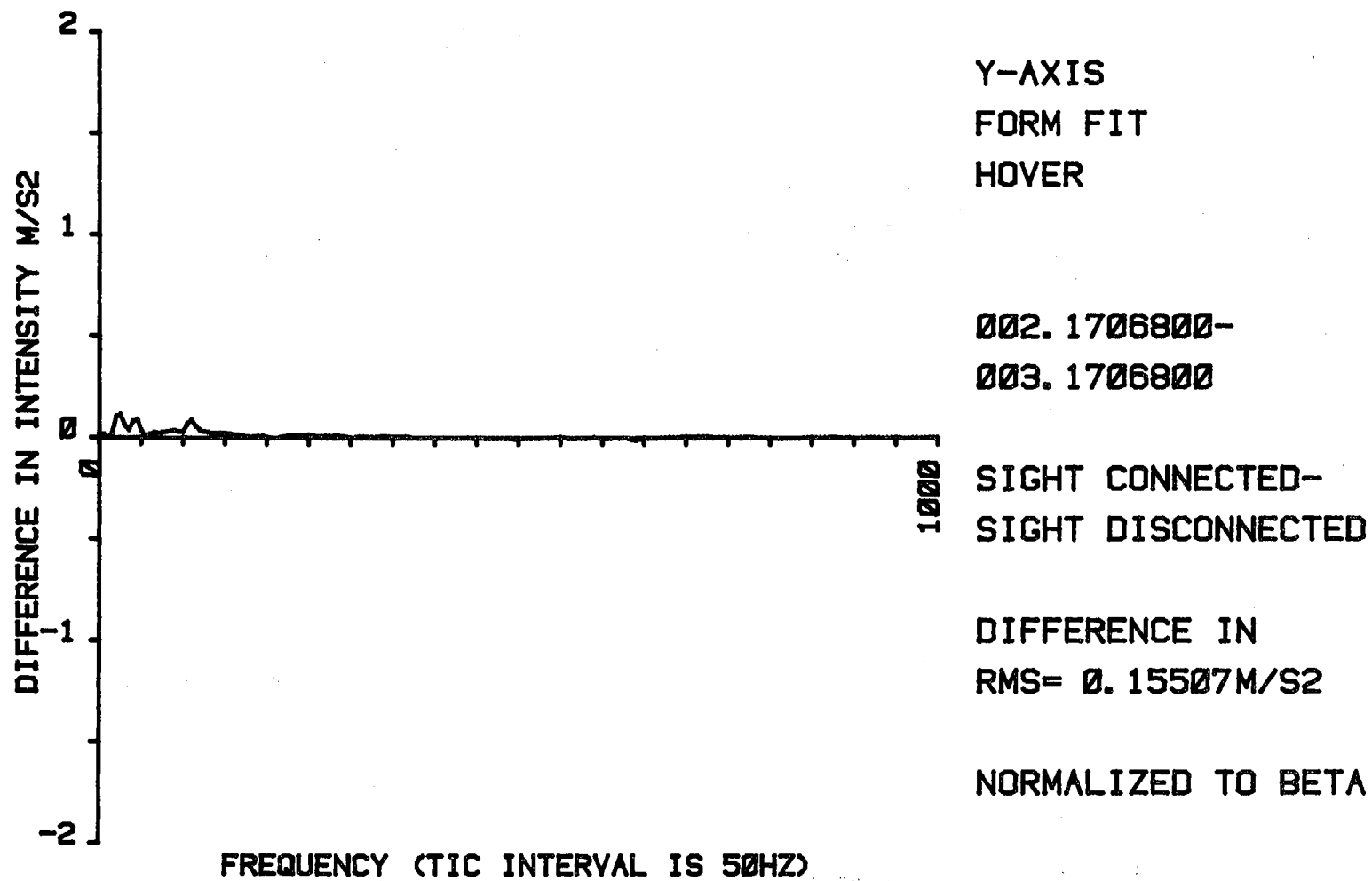


FIGURE D16. DIFFERENCE IN HELMET ACCELERATION

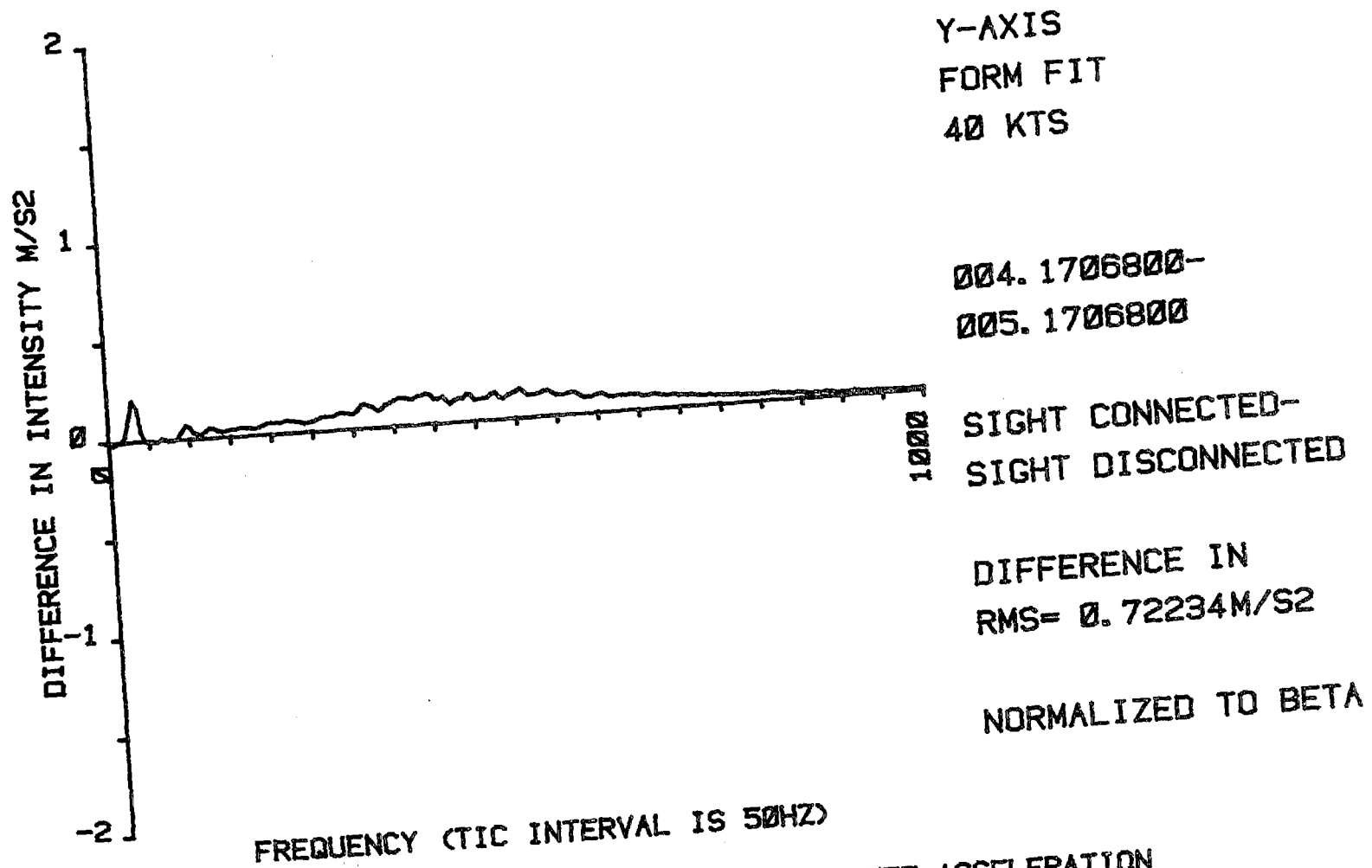


FIGURE D17. DIFFERENCE IN HELMET ACCELERATION

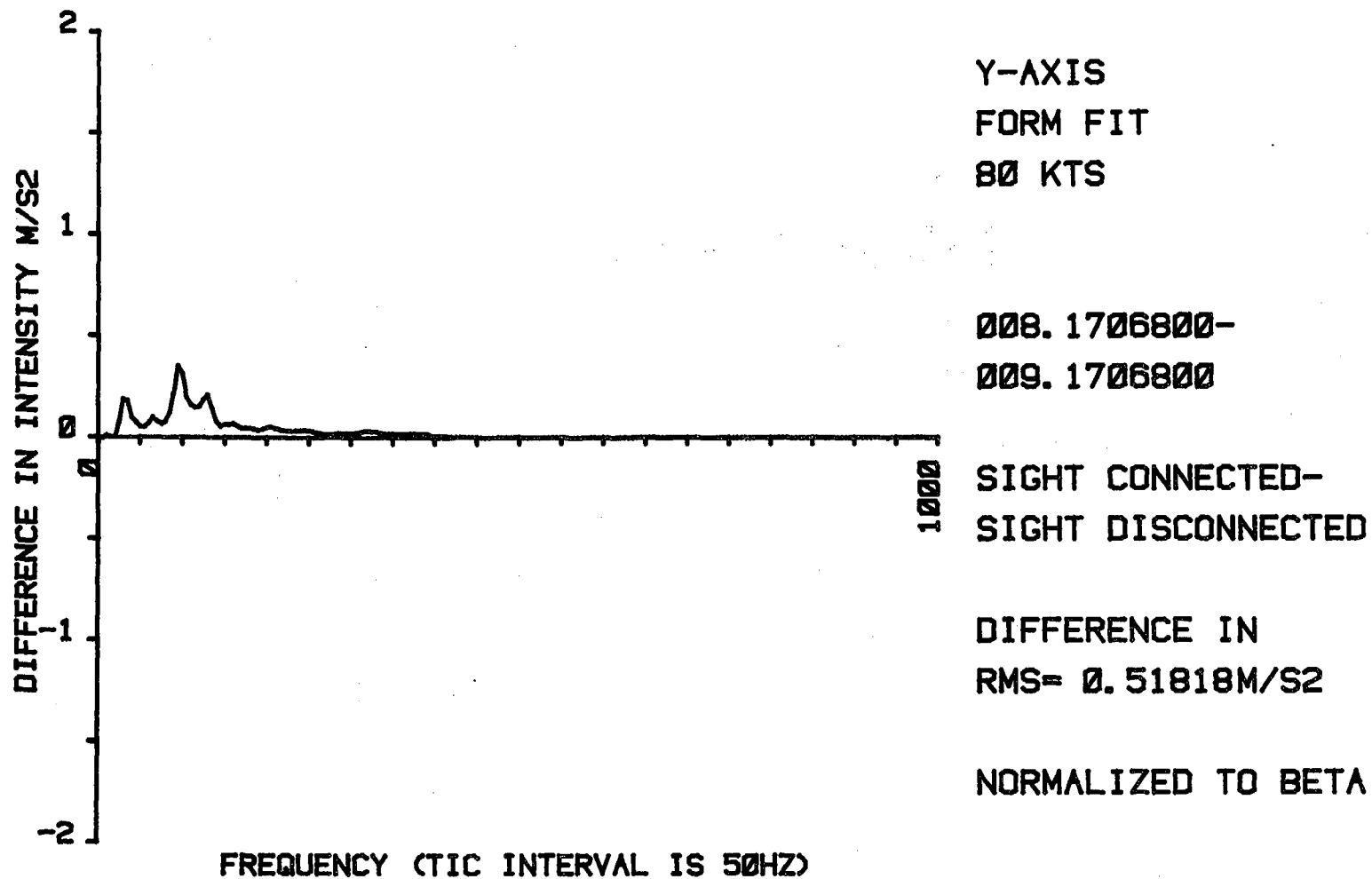


FIGURE D18. DIFFERENCE IN HELMET ACCELERATION

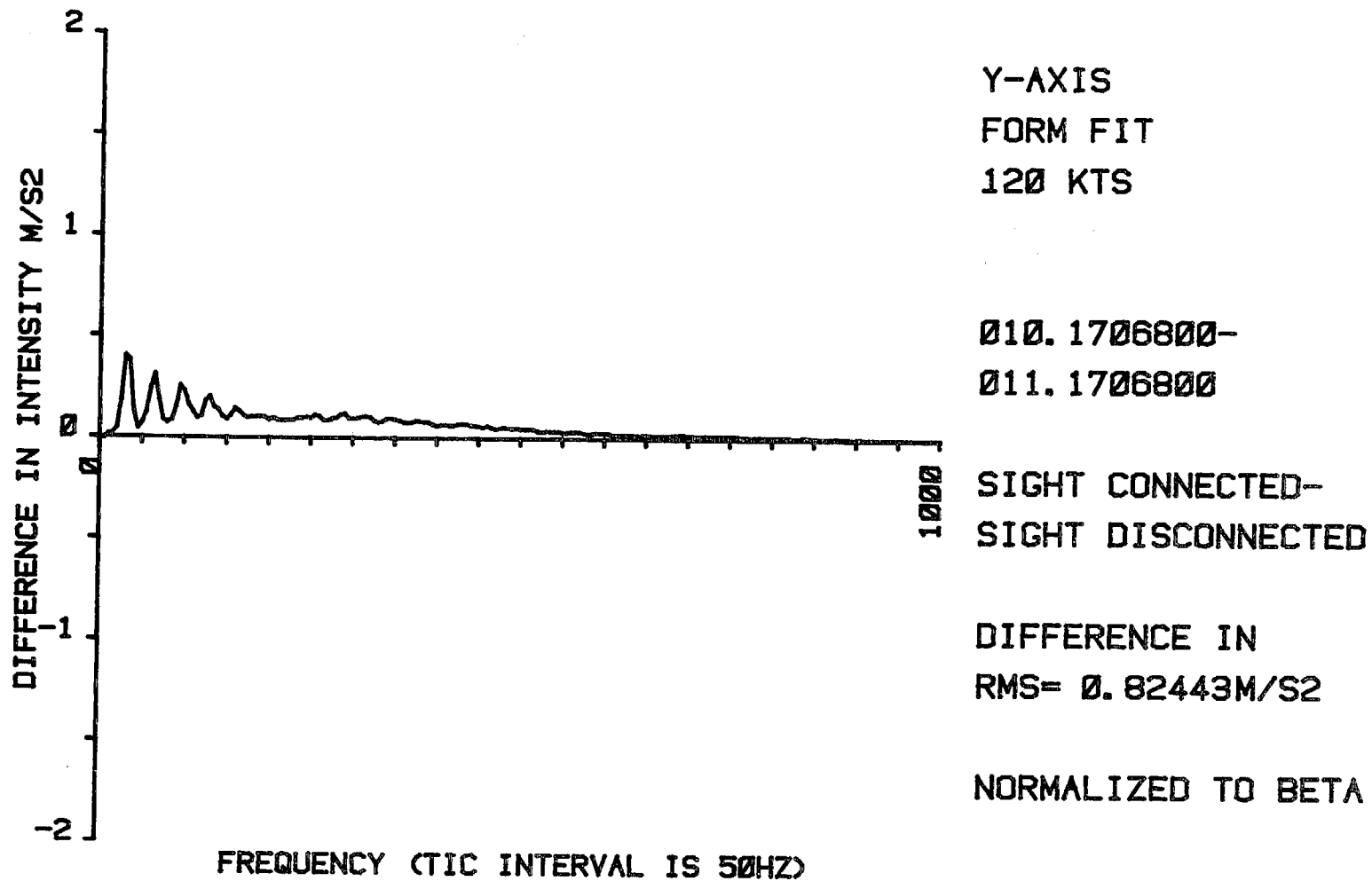


FIGURE D19. DIFFERENCE IN HELMET ACCELERATION

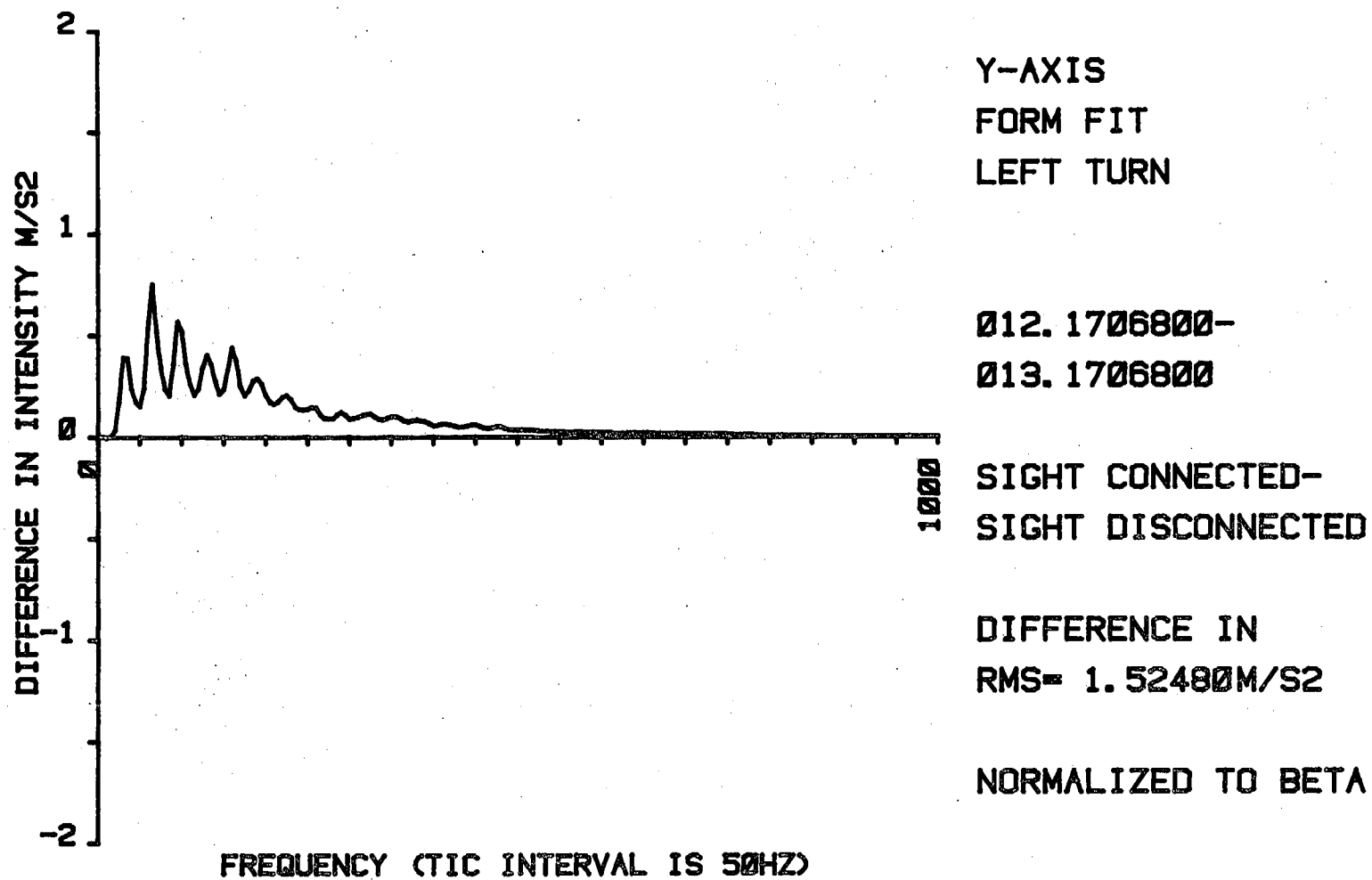


FIGURE D20. DIFFERENCE IN HELMET ACCELERATION

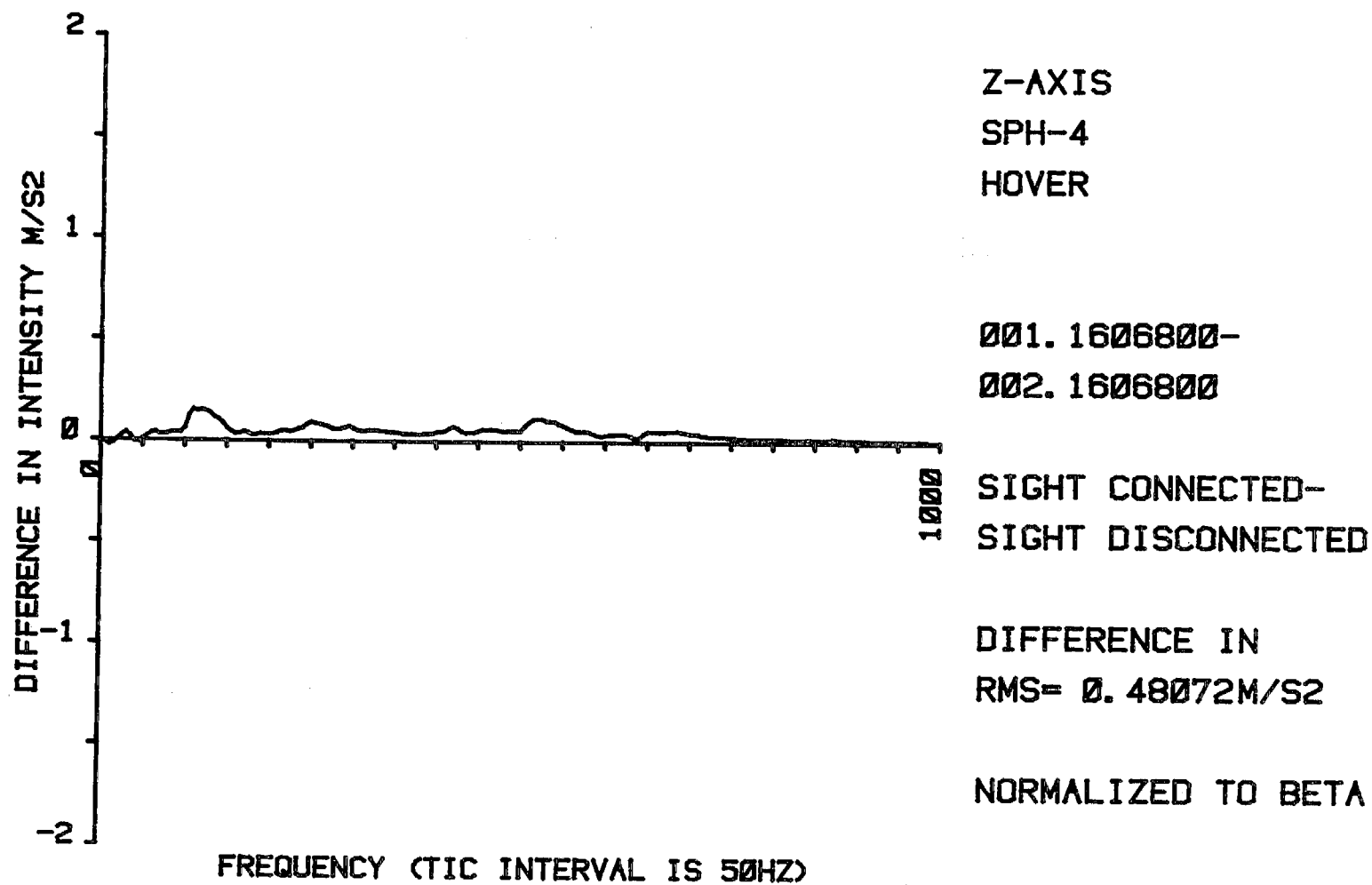
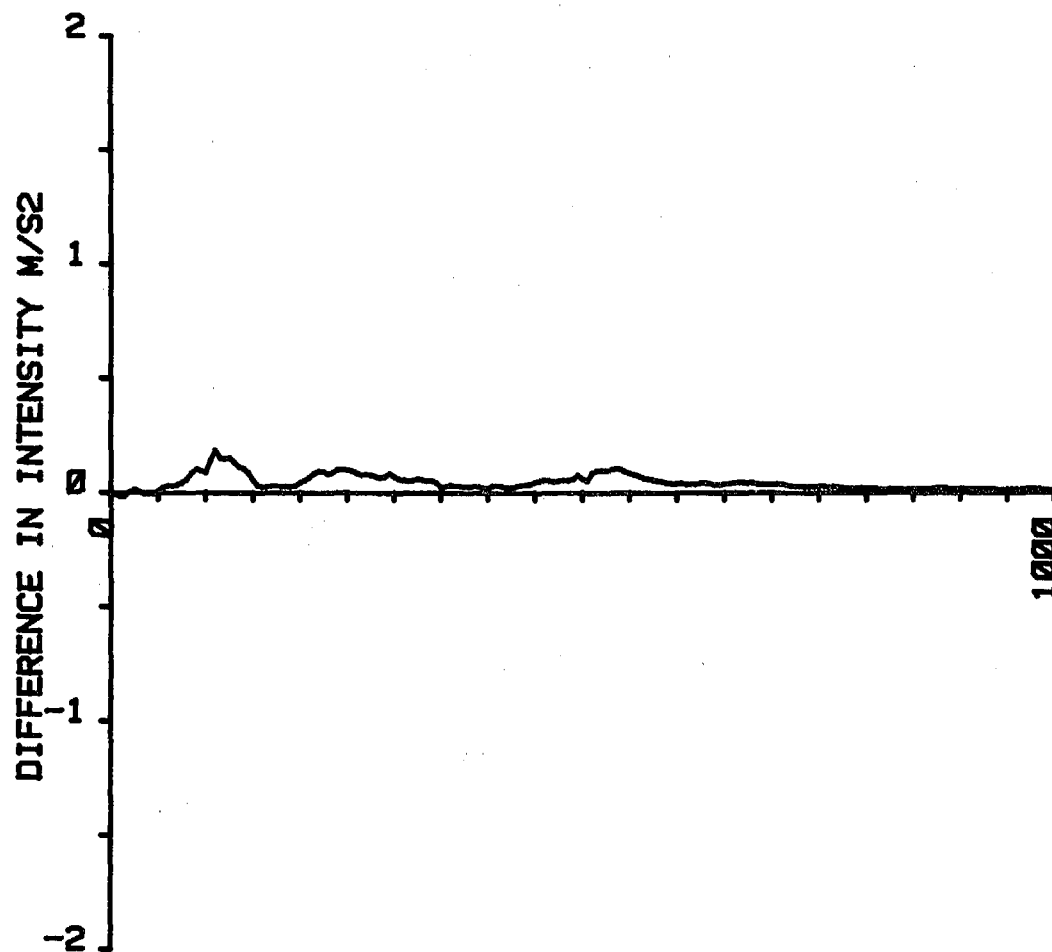


FIGURE D21. DIFFERENCE IN HELMET ACCELERATION

16



Z-AXIS

SPH-4

40 KTS

003. 1606800-

004. 1606800

SIGHT CONNECTED-
SIGHT DISCONNECTED

DIFFERENCE IN
RMS= 0.47561M/S²

NORMALIZED TO BETA

FREQUENCY (TIC INTERVAL IS 50HZ)

FIGURE D22. DIFFERENCE IN HELMET ACCELERATION

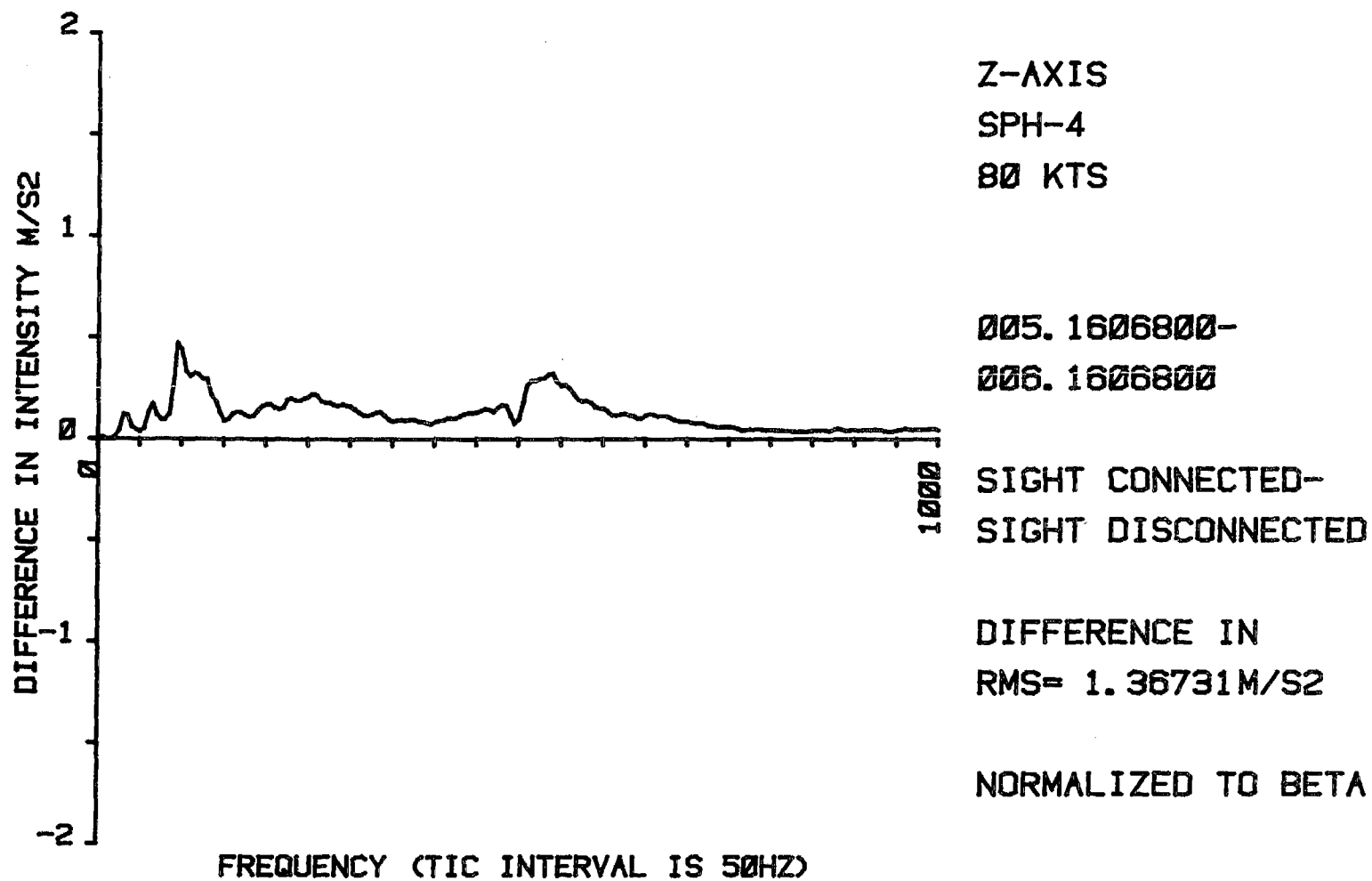
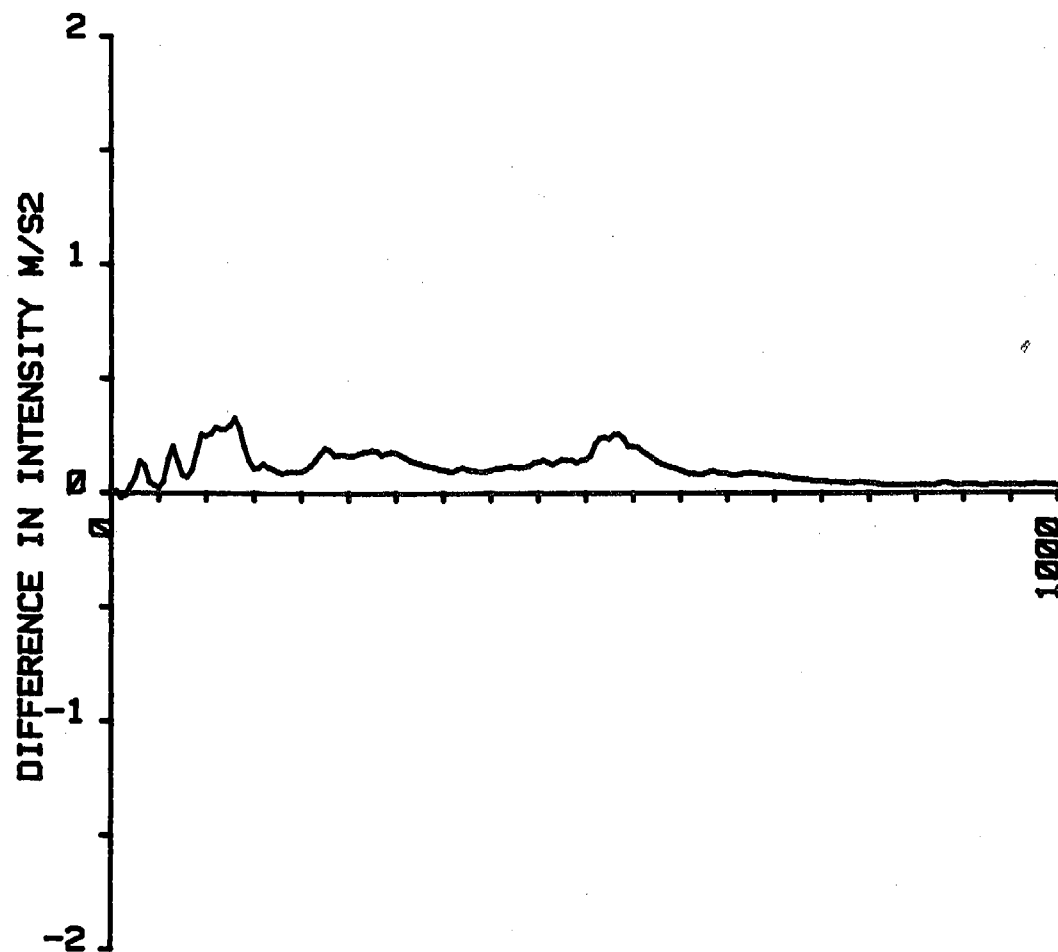


FIGURE D23. DIFFERENCE IN HELMET ACCELERATION



Z-AXIS
SPH-4
120 KTS

007. 1606800-
008. 1606800

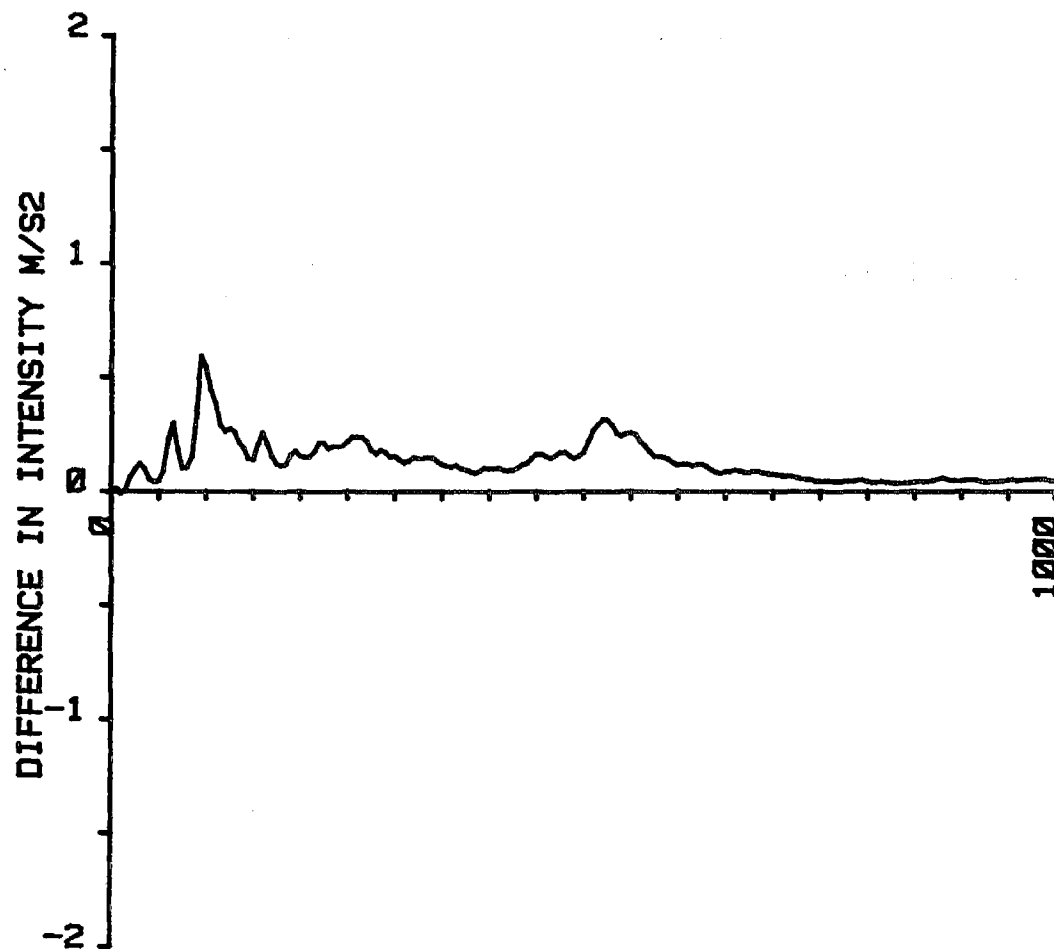
SIGHT CONNECTED-
SIGHT DISCONNECTED

DIFFERENCE IN
RMS= 1.18213M/S2

NORMALIZED TO BETA

FREQUENCY (TIC INTERVAL IS 50HZ)

FIGURE D24. DIFFERENCE IN HELMET ACCELERATION



Z-AXIS
SPH-4
LEFT TURN

009.1606800-
010.1606800

SIGHT CONNECTED-
SIGHT DISCONNECTED

DIFFERENCE IN
RMS= 1.48575M/S2

NORMALIZED TO BETA

FREQUENCY (TIC INTERVAL IS 50HZ)

FIGURE D25. DIFFERENCE IN HELMET ACCELERATION

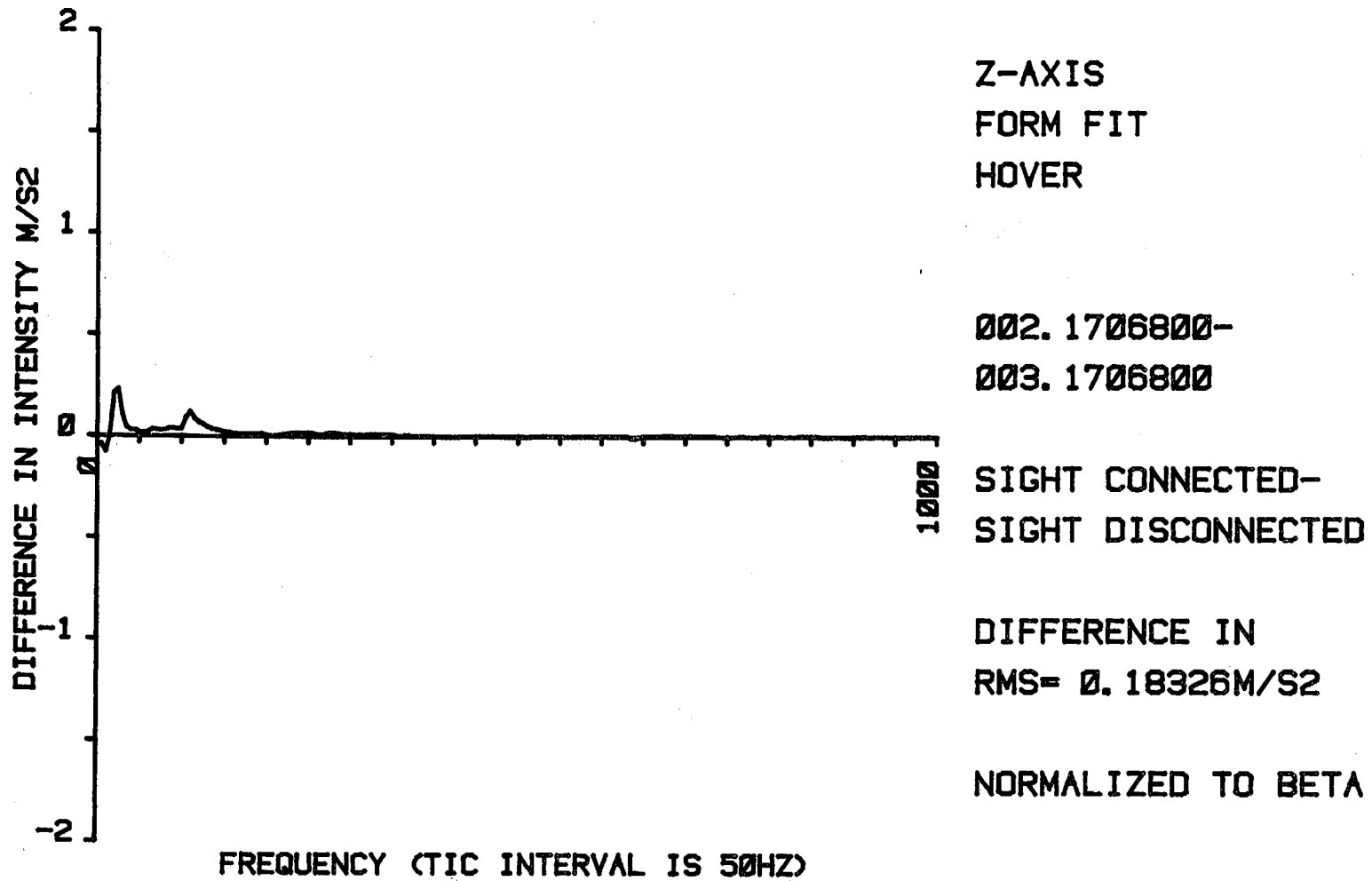
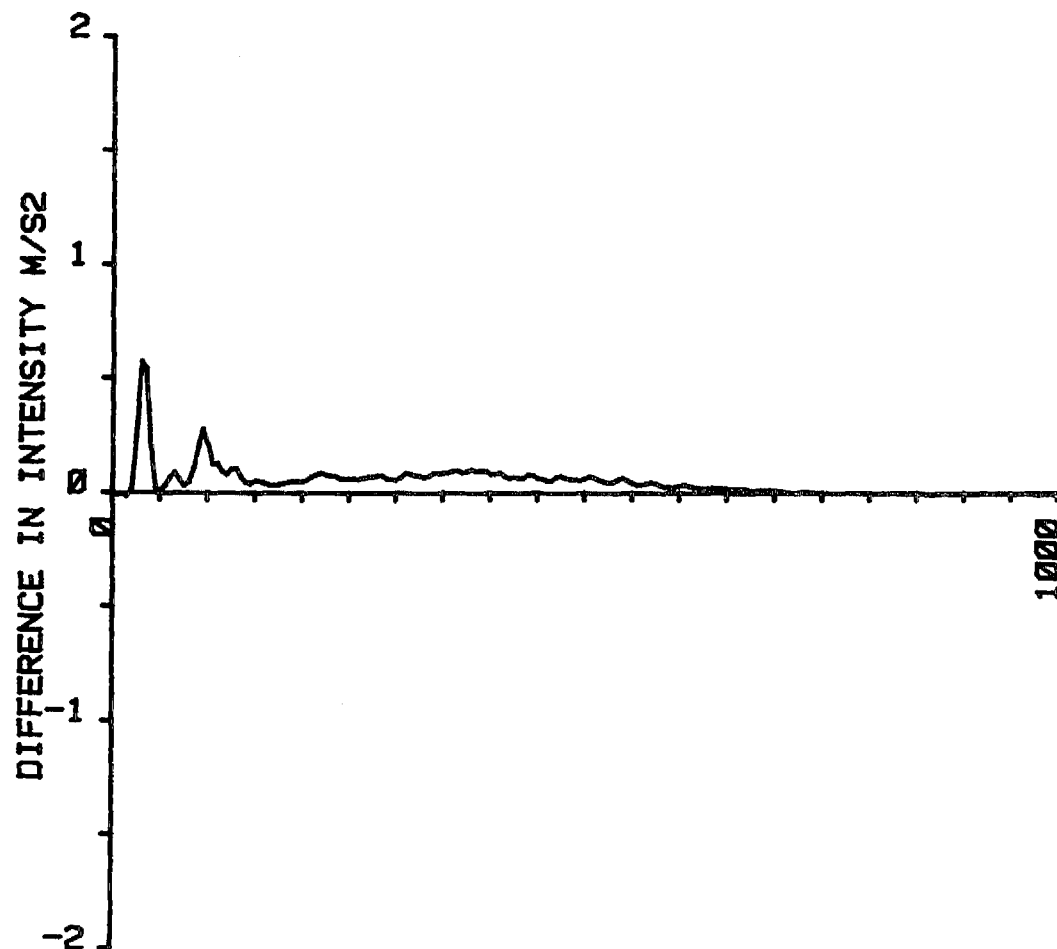


FIGURE D26. DIFFERENCE IN HELMET ACCELERATION



Z-AXIS
FORM FIT
40 KTS

004.1706800-

005.1706800

SIGHT CONNECTED-
SIGHT DISCONNECTED

DIFFERENCE IN
RMS= 0.74619M/S2

NORMALIZED TO BETA

FREQUENCY (TIC INTERVAL IS 50HZ)

FIGURE D27. DIFFERENCE IN HELMET ACCELERATION

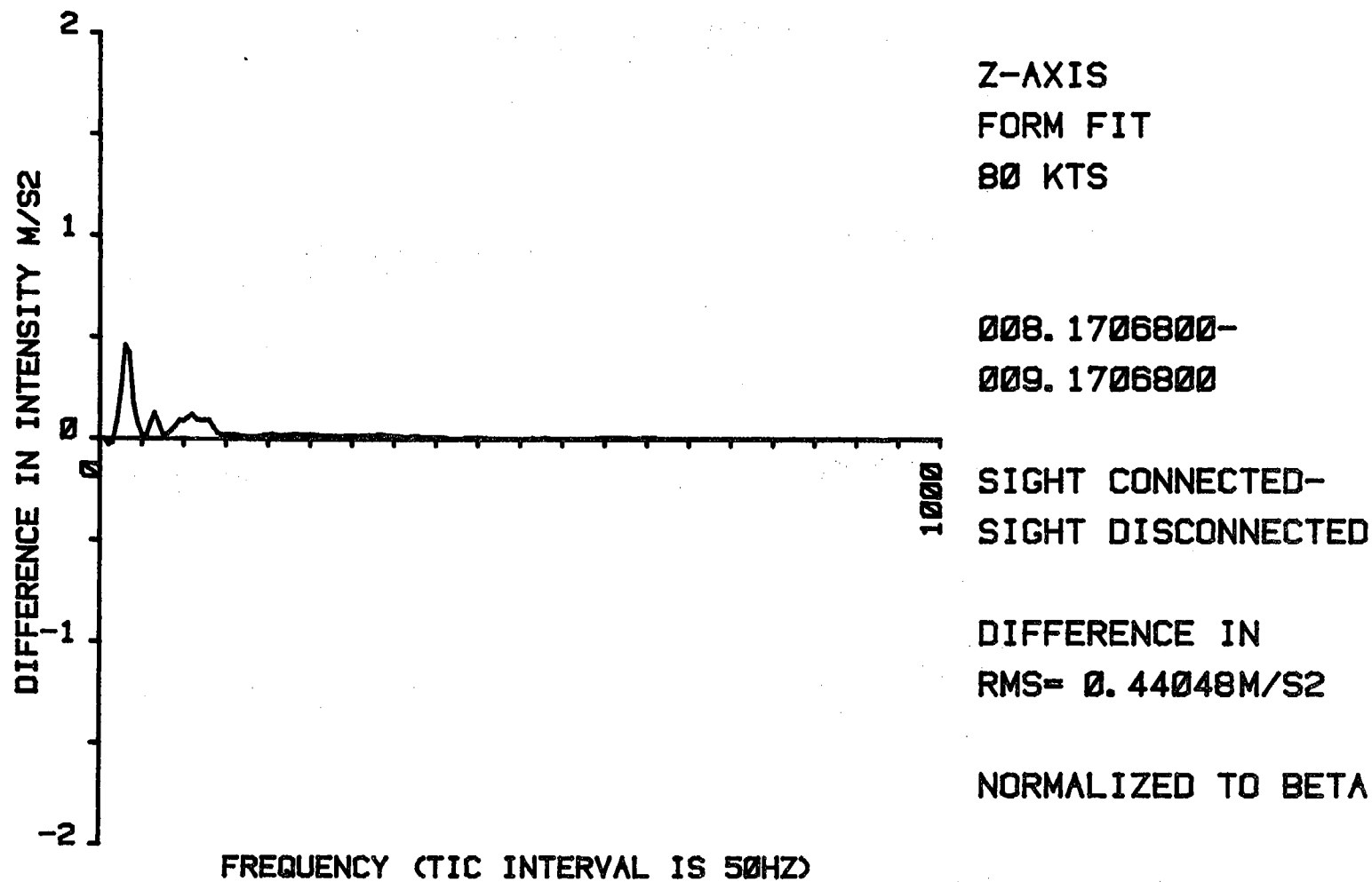


FIGURE D28. DIFFERENCE IN HELMET ACCELERATION

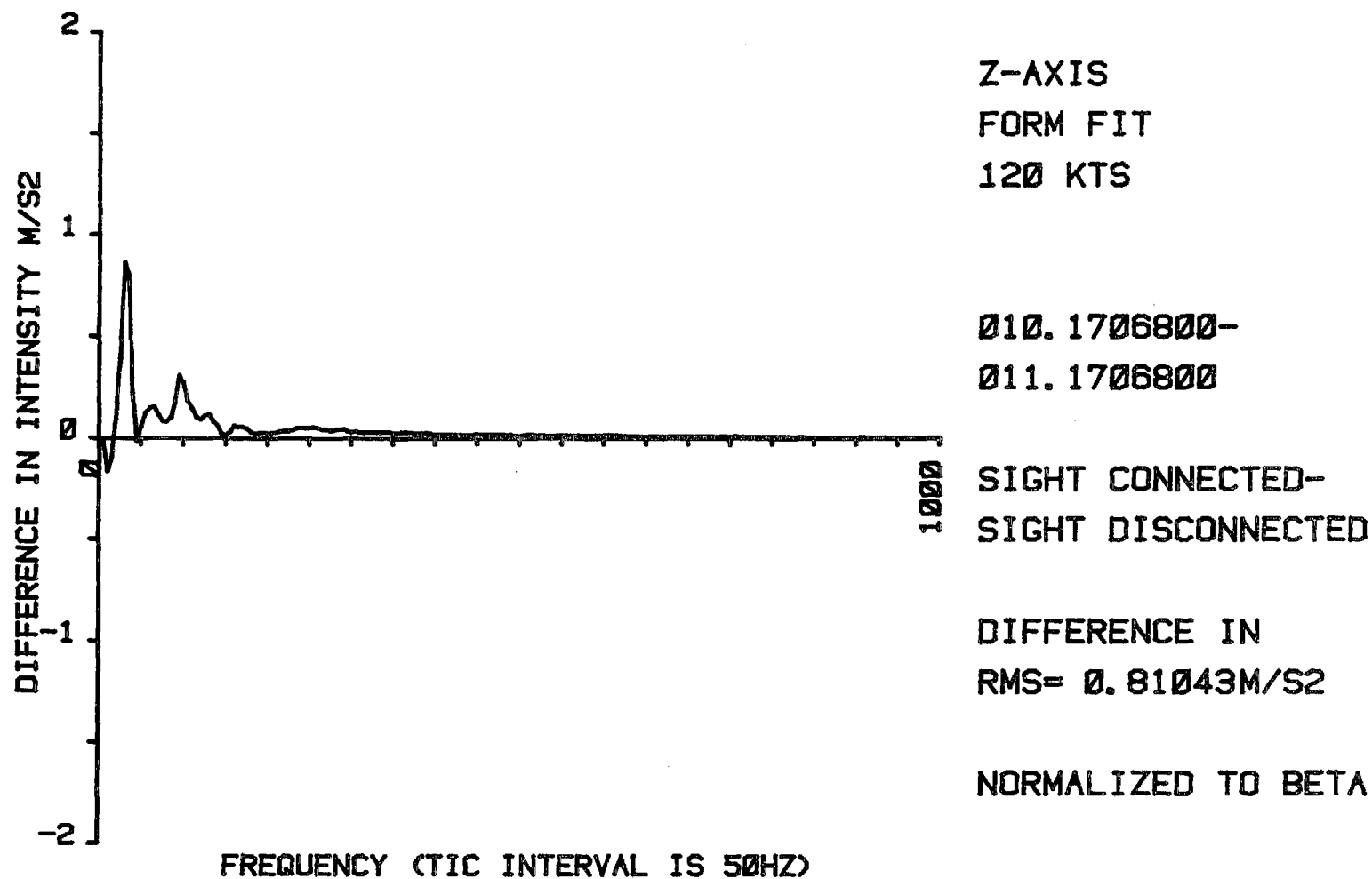


FIGURE D29. DIFFERENCE IN HELMET ACCELERATION

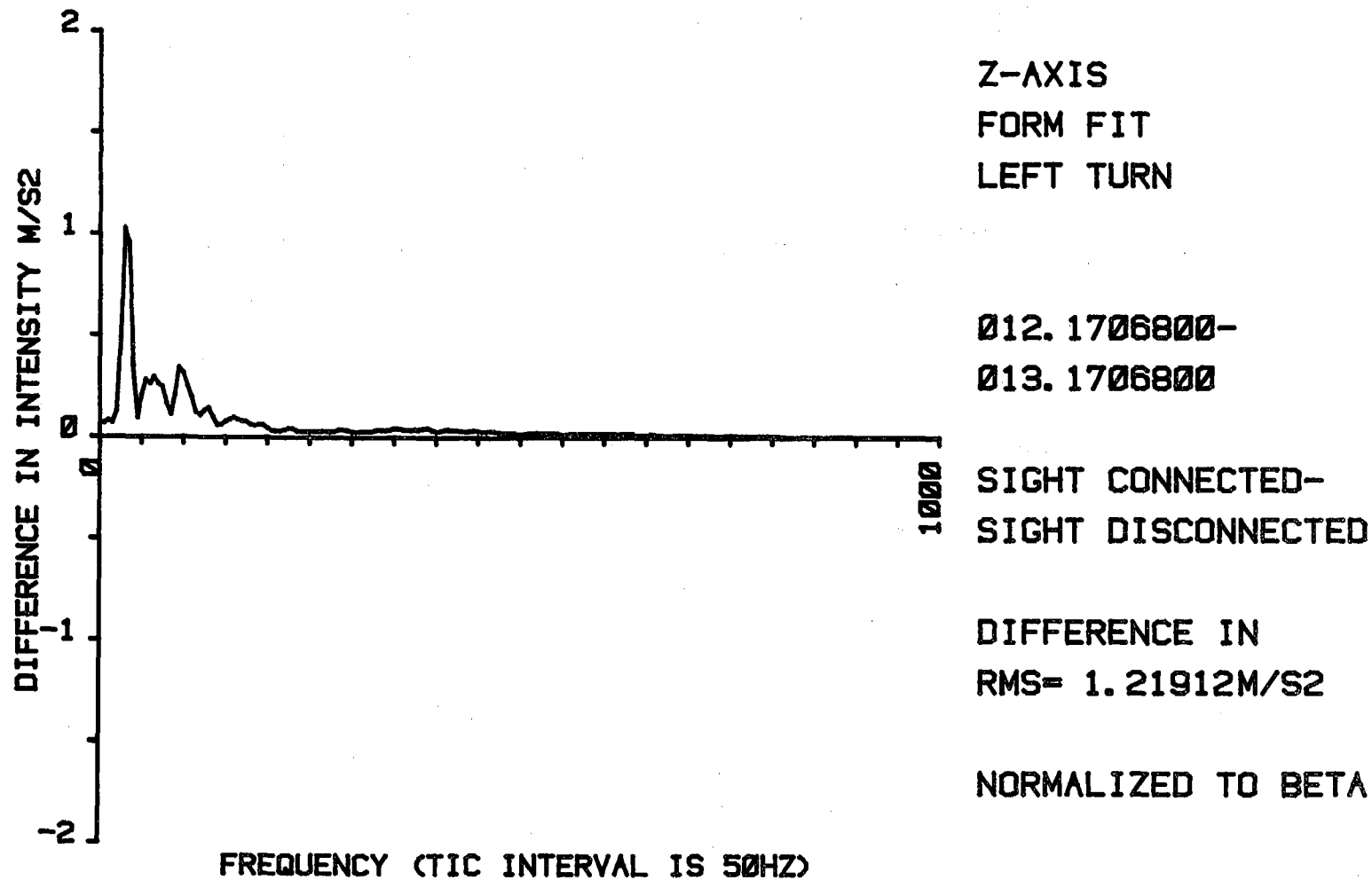


FIGURE D30. DIFFERENCE IN HELMET ACCELERATION